JUNE 2, 1956 PAGES 813 TO 866

THE LANCET

Offices: 7, ADAM STREET, ADELPHI, W.C.2
Telegrams: LANCET, RAND, LONDON Telephone: TEMPLE BAR 7228 and 7229

No. XXII OF VOL. I, 1956 LONDON, SATURDAY, JUNE 2, 1956 Pp. 112—Price 1s. 6d.
No. 6927 VOL. CCLXX Founded 1823 PUBLISHED WEEKLY Registered as a Newspaper Annual Subscription: £3 3s.

'SONERYL' THE ORIGINAL BUTOBARBITONE
Trade Mark Brand
M&B
Manufactured by MAY & BAKER LTD
distributors: PHARMACEUTICAL SPECIALITIES (MAY & BAKER) LTD., DAGENHAM

JUN 18 1956
Cont. Copy

Recently Issued.

THE GENESIS AND PREVENTION OF CANCER
By W. SAMPSON HANDLEY, M.S., F.R.C.S.
Consultant Surgeon to the Middlesex Hospital
Second Edition with 2 new chapters 21s. net.
London: John Murray. New York: The Macmillan Co.

Third Edition

INTRODUCTION TO DISEASES OF THE CHEST
By JAMES MAXWELL, M.D.(Lond.), F.R.C.P.(Lond.)
Physician, Royal Chest Hospital; Physician to the Ministry's Mass X-ray Unit; Consulting Physician, Royal National Sanatorium, Bournemouth; late Physician, St. Bartholomew's Hospital.
Demy 8vo 308 + xii 66 Half-tone Illustrations
12s. 6d. net, plus 8d. postage.
Hodder & Stoughton Ltd., 20, Warwick-square, London, E.C.4

Sixth Edition *Now available*

PRINCIPLES OF MEDICAL STATISTICS
By A. BRADFORD HILL, C.B.E., D.Sc., Ph.D., F.R.S.
Demy 8vo 314 + x 10s. 6d. net, plus 6d. postage
Revised and enlarged (containing a new chapter on Clinical Trials and 16 pages of random sampling numbers).
The Lancet Limited, 7, Adam-street, Adelphi, London, W.C.2

UNITED STATES OF AMERICA AND CANADIAN SELLING RIGHTS HELD BY OXFORD UNIVERSITY PRESS, INC.
114, Fifth Avenue, New York 11, N.Y., U.S.A.

Third Edition

ABDOMINAL OPERATIONS
By RODNEY MAINGOT, F.R.C.S.
Surgeon, Royal Free Hospital
Completely revised. 74 Chapters (11 new). 1594 Illustrations
11 Colour Plates. 1568 Pages. Price £8 10s. net.
H. K. Lewis & Co. Ltd., 136, Gower-street, W.C.1

MANAGEMENT OF BURNS
Six articles prepared by a subcommittee of the BRITISH ASSOCIATION OF PLASTIC SURGEONS
Reprinted from THE LANCET *with an appendix*
These articles record the practice of surgeons who are treating burns every day and who see the good results of treatment that is carefully planned from the start. Here is their plan, fully but briefly set out.
48 pages Price 2s. 6d. (postage 4d.)
The Lancet Limited, 7, Adam-street, Adelphi, London, W.C.2

THE LAW AND ETHICS OF DENTAL PRACTICE
By R. W. DURAND, M.R.C.S., L.R.C.P.
Formerly Secretary of the Medical Protection Society
and
D. MORGAN, L.D.S. (Leeds)
Formerly Deputy Dental Secretary of the British Dental Association
Foreword by Professor R. V. BRADLAW, M.D.S., Dunelm, F.D.S., M.R.C.S. Eng.
Professor of Oral Pathology, Durham University
Director, Newcastle-upon-Tyne Dental School
Expert guidance on the many problems which confront the dentist
Demy 8vo 98 + viii Price 7s. 6d. net, plus 4d. postage
Hodder & Stoughton Ltd., 20, Warwick-square, London, E.C.4

EDWARD ARNOLD

Hutchison's Food and the Principles of Dietetics
V. H. MOTTRAM, M.A., and G. GRAHAM, M.A., M.D., F.R.C.P.
Eleventh Edition
648 *pages* 12 *line drawings*
40*s. net*

Topley and Wilson's Principles of Bacteriology and Immunity
G. S. WILSON, M.D., F.R.C.P., D.P.H., and A. A. MILES, C.B.E., M.A., M.D., F.R.C.P.
Fourth Edition
"To any professional bacteriologist, life is unthinkable without a copy of Topley and Wilson."—*The Lancet.*
2388 *pages* 303 *illustrations*
£8 *net the set of* 2 *vols.*

Poliomyelitis
W. RITCHIE RUSSELL, C.B.E., D.Sc., F.R.C.P.
Second Edition
"It would be hard to find anywhere an account of the clinical aspects of poliomyelitis so concise and yet so comprehensive."—*The Lancet.*
159 *pages* 40 *illustrations*
16*s. net*

41 MADDOX STREET, LONDON, W.1

ASTHMA AND THE BUSY PRACTITIONER

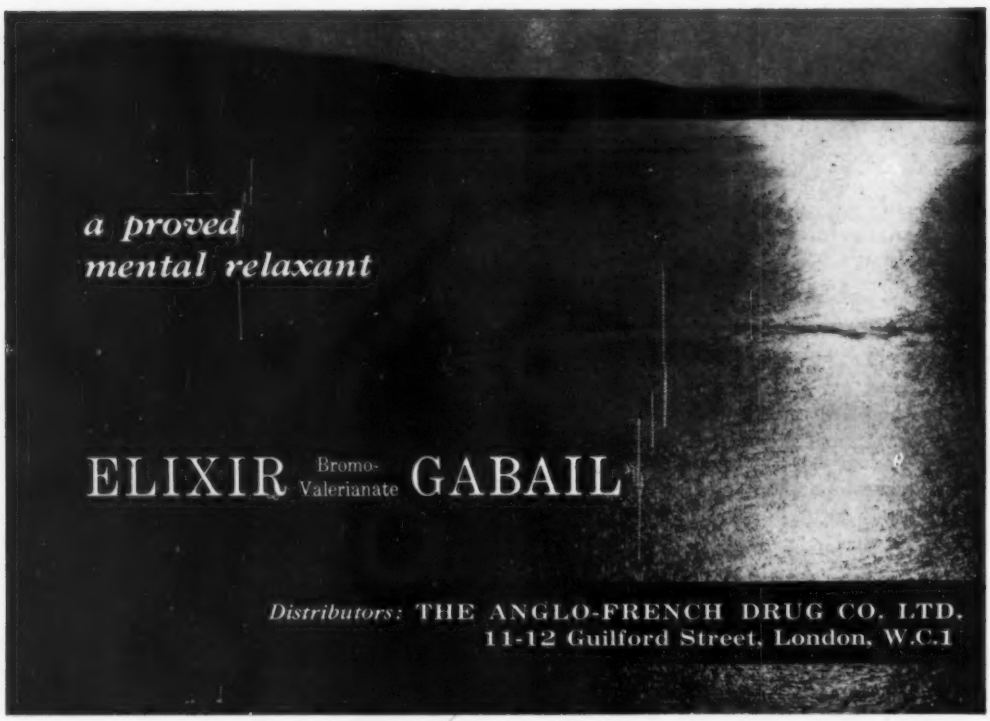
Increasing demands on the practitioner's time make the rapid control of asthma a matter of primary importance. FELSOL has for years been relied upon by doctors in all parts of the world to which it has been introduced, for the immediate and prolonged relief it gives in BRONCHOSPASM. Easy to take, FELSOL gives full relief in perfect safety (even in cardiac cases) without morphia or other narcotics.

★ NON-CUMULATIVE

★ NO CONTRA-INDICATIONS

Clinical sample and literature on request

BRITISH FELSOL COMPANY LTD., 206/212 ST. JOHN STREET, LONDON, E.C.1



JUNE 2, 1956 PAGES 813 TO 866

THE LANCET

A JOURNAL OF BRITISH AND FOREIGN MEDICINE, SURGERY, OBSTETRICS, PHYSIOLOGY, PATHOLOGY, PHARMACOLOGY, PUBLIC HEALTH, AND NEWS

No. 6927 LONDON: SATURDAY, JUNE 2, 1956 CCLXX

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ORIGINAL ARTICLES

Changes in Medical Education
J. R. ELLIS, F.R.C.P.
(to be concluded) 813

Parity and the Incidence of Diabetes
D. A. PYKE, M.R.C.P. 818

Bed Rest in the Treatment of Pulmonary Tuberculosis
W. F. TYRRELL, M.B. 821

A Calcium-infusion Test: I
B. E. C. NORDIN, M.R.C.P.
RUSSELL FRASER, F.R.C.P. 823

A Calcium-infusion Test: II
J. M. FINLAY, F.R.C.P.(C.)
B. E. C. NORDIN, M.R.C.P.
RUSSELL FRASER, F.R.C.P. 826

Roseola Infantum
N. D. REIS, M.B. 830

Control of Aldosterone Excretion
A. F. MULLER, M.D.
ANNE RIONDEL, ING. CHEM.
Prof. R. S. MACH, M.D. 831

Inguinal Endometriosis
T. L. DORMANDY, M.B. 832

Barbiturate Coma with Hypothermia
D. W. EASON, M.B.
F. I. MACNAUGHTON, M.B. 835

Phenobarbitone Poisoning Treated with Bemegride
A. D. F. HURDLE, M.B.
B. K. LANE, M.B. 836

NEW INVENTIONS

Modified "Oxford" Labour-ward Bed
W. D. WYLIE, F.F.A.R.C.S. 840

SPECIAL ARTICLES

Bedwetting
J. M. BLOMFIELD, M.A.
J. W. B. DOUGLAS, B.M. 850

Tuberculosis in a Hospital for the Mentally Defective
R. G. LOUDON, M.R.C.P.E.
J. WILLIAMSON, M.R.C.P.E.
D. F. ROBERTSON, M.B. 853

General Medical Council 855

LEADING ARTICLES

"ANÆMIA" IN PREGNANCY 843

UPPER RESPIRATORY VIRUS INFECTIONS 844

FORT MIT DEM SPRAY! 845

ANNOTATIONS

Prognosis of Cardiovascular Syphilis 846

Non-cellular Histology 847

Obstetric Acute Yellow Atrophy 847

Fungus Infections of Bone 848

Child Mental Welfare 848

Electrolytes and the Electrocardiogram 849

Vascular Headache 849

MEDICAL SOCIETIES

British Orthopædic Association .. 837

British Institute of Radiology ... 839

PUBLIC HEALTH

Tracing a Typhoid Carrier
F. BEDO HOBBS, M.R.C.P. 855

Contaminated Flour 856

Spilled Virus 856

Another Hazard of Smoking 856

LETTERS TO THE EDITOR

Burns and Scalds (Dr. Leonard Colebrook, F.R.S.; Mr. M. N. Tempest, F.R.C.S.E.) 858

Respiratory Involvement in Poliomyelitis (Prof. J. Trueta, F.R.C.S., Dr. M. Agerholm) 859

Paraplegia Following Spinal Anæsthesia (Sir Francis Walshe, F.R.C.P., F.R.S.) 859

Acute and Latent Porphyria (Dr. C. E. Astley, Dr. A. A. Williams; Dr. S. R. F. Whittaker, Mr. T. P. Whitehead) 860

Aldosterone (Dr. O. Garrod, Mrs. S. A. Simpson, B.SC., Mr. J. F. Tait, PH.D.) 860

Composition of Flour (Dr. Franklin Bicknell) 861

Fats and Disease (Dr. Erich Geiringer) 861

Treatment of Superficial Sepsis (Dr. M. E. Fearnley) 861

Treatment of Tetanus (Major Charles Sanders, L.M.S.S.A.) 861

Perforated Acute and Chronic Peptic Ulcer (Mr. Hermon Taylor, F.R.C.S., Mr. R. P. Warren, F.R.C.S.) 862

Smoking (Dr. J. A. Bruce Young) 862

Home Confinement (Dr. Julia Fourman; Dr. Ian Samuel) ... 862

Rhesus (D) Factor in Sarcoidosis (Dr. H. C. Smellie) 863

Anæsthesia in Obstetrics (Dr. Paul Azzopardi; Dr. F. R. Gusterson; Dr. J. W. R. McIntyre) 863

REVIEWS

Notices of Books 841

IN ENGLAND NOW

A Running Commentary by Peripatetic Correspondents ... 857

OBITUARY

John Dempster Fraser 864

Gustav Herrnheiser 864

NOTES AND NEWS

Feeding in Mental Hospitals 865

Royal College of Midwives 865

Casualty Centres at Swindon 865

General Medical Council 865

Royal College of Obstetricians and Gynæcologists 865

Society of Apothecaries of London 865

Royal College of Physicians of London 865

An R.A.M.C. War Memorial 865

University of London 866

Biochemical Society 866

Cambridge Graduates' Medical Club 866

Diary of the Week 864

Appointments 866

Births, Marriages, and Deaths ... 866

'ANCOLAN'

TRADE MARK

Tablets containing 25 mg meclozine dihydrochloride

THE B.D.H. ANTIHISTAMINIC

IN HAY FEVER *and other allergic conditions and* **MOTION SICKNESS**

ADVANTAGES long duration of action
exceptionally well tolerated

Basic N.H.S. prices: Plastic container of 10 tablets 1/8
Bottles of 25 tablets 3/8
„ „ 250 „ 32/6

Literature and samples will be sent on request

THE BRITISH DRUG HOUSES LTD. (Medical Dept.) LONDON N.1

KAYLENE-OL

(brand of colloidal kaolin B.P. and liquid paraffin)

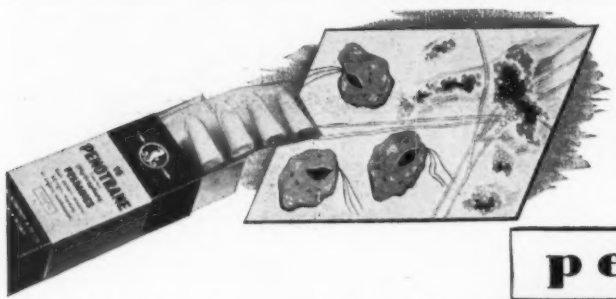
in the treatment of Intestinal Toxæmia, Chronic Colitis and Spastic Constipation

All the products of Kaylene (Chemicals) Limited are in Category 2 or Category 4 in the Ministry of Health's Classified List, and are therefore prescribable on Form E.C.10.

Samples and literature on request.

KAYLENE (CHEMICALS) LIMITED

WATERLOO ROAD, LONDON, N.W.2



Effective against both Trichomonas and Monilia

penotrane

PHENYLMERCURIC DINAPHTHYLMETHANE DISULPHONATE

in vaginal therapy

The powerful trichomonacidal and fungicidal properties of PENOTRANE present the greatest advantage in the treatment of vaginal discharge, particularly trichomonal vaginitis and moniliasis. PENOTRANE is also strongly bactericidal and it deeply penetrates the vaginal mucosa. Both the Pessaries and Vaginal Cream are buffered to approximate the normal vaginal acidity

INDICATIONS: ★ Vaginal Discharge due to trichomonal, monilial and coccal infections. ★ Pruritus Vulvae. ★ Obstetrical Lubrication. ★ Pre-operative Skin Disinfection.

AVAILABILITY:

PENOTRANE	Applicator Sets—containing Penotrane Vaginal Cream & disposable applicators.
PENOTRANE	Aqueous Solution—Bottles of 100, 500 and 2,000 c.c.
PENOTRANE	Jelly—Tubes of 1 oz.
PENOTRANE	Pessaries—Cartons of 15 and 100.
PENOTRANE	Powder — Polythene Insufflating Containers.
PENOTRANE	Tincture—Bottles of 15, 100, 500 and 2,000 c.c.

Literature and professional samples on request.

A CWD MEDICAL PRODUCT

WARD, BLENKINSOP & COMPANY, LIMITED

YORK HOUSE, 37, QUEEN SQUARE, LONDON, W.C.1.

Telephone: HOLborn 5992/6 (5 lines.) Telegrams: Duochem, Westcent, London.

HENRY KIMPTON'S PUBLICATIONS

New Book — **BING'S LOCAL DIAGNOSIS IN NEUROLOGICAL DISEASES** — Just Ready
Translated, revised and enlarged from the fourteenth German edition
By **WEBB HAYMAKER**, M.D.
9¾″ × 6¼″ — 478 Pages — 225 Illustrations, including 9 in Colour — Cloth — Price **£6 5s.** net

New (3rd) Edition — **UROLOGICAL SURGERY** — Just Ready
By **AUSTIN INGRAM DODSON**, M.D., F.A.C.S.
THIRD EDITION, REVISED AND ENLARGED
9¾″ × 6¼″ — 868 Pages — 664 Illustrations — Cloth — Price **£7 10s.** net

New (2nd) Edition — **DISEASES OF THE ENDOCRINE GLANDS** — Just Ready
By **LOUIS J. SOFFER**, M.D., F.A.C.P.
SECOND EDITION, REVISED
9½″ × 6½″ — 1032 Pages — 102 Illustrations and 3 Coloured Plates — Cloth — Price **£6** net

New (5th) Edition — **CLINICAL LABORATORY DIAGNOSIS** — Just Ready
By **SAMUEL A. LEVINSON**, M.S., M.D., Ph.D., and **ROBERT P. McFATE**, Ch.E., M.S., Ph.D.
FIFTH EDITION, REVISED AND ENLARGED
9½″ × 6½″ — 1246 Pages — 244 Illustrations and 13 Plates, 11 in Colour — Cloth — Price **93s. 6d.** net

New Book — **CLINICAL ELECTROCARDIOGRAPHY** — Just Ready
Part I: The Arrhythmias
With an Atlas of Electrocardiograms
By **LOUIS N. KATZ**, A.B., M.A., M.D., and **ALFRED PICK**, M.D.
10″ × 7″ — 737 Pages — 415 Illustrations — Cloth — Price **£6 10s.** net

25 Bloomsbury Way — **HENRY KIMPTON** — **London, W.C.1**
Medical Book Department of Hirschfeld Brothers Ltd.

in prostatic carcinoma

TACE

A NEW FAT-STORED ŒSTROGEN

TACE
offers a new treatment for prostatic carcinoma and other conditions responsive to œstrogen therapy. While resembling stilbœstrol and hexœstrol chemically, it differs clinically in these important respects:

TACE has virtually no effect on the pituitary. Resistance does not develop on prolonged therapy and in cases where resistance to other œstrogens has already developed, 'TACE' will often offer the prospect of continued relief of symptoms.

TACE is virtually free from the usual side effects of œstrogen therapy. Painful gynæcomastia does not occur in the male—nausea, vomiting and withdrawal bleeding are not produced in the female.

TACE is stored in body fat—its activity is gradually released in a manner closely resembling natural œstrogen secretion.

REFERENCES
Endocrine Therapy in Carcinoma of the Prostate. *J. Amer. med. Ass.* (1955), 157, 581.
Follow-up Study of Tace-treated prostatic Cancer Patients. Read at the TACE Symposium, Cincinnati, January 17th, 1952.

'TACE' is available in capsules each containing 12 mg. chlorotrianisene in bottles of 60 and 300 capsules. *Detailed literature is available on request.*

INDICATIONS
1. **PROSTATIC CARCINOMA**
2. **MENOPAUSAL SYNDROME**
3. **INHIBITION OF LACTATION**

Merrell

'TACE' brand chlorotrianisene is distributed in the United Kingdom and Eire by
RIKER LABORATORIES LTD., LOUGHBOROUGH, LEICS.
for the Wm. S. Merrell Co., London.

LIVER and YEAST CONCENTRATE

Combining:

- **LIVER EXTRACT**
- **YEAST**
- **VITAMIN B_1**
- **VITAMIN B_2**

Packed in 4, 8 and 16 oz. bottles

Write for literature and samples

Nutritional adequacy is a fundamental requisite for normal convalescence.

Liver and Yeast Concentrate is an excellent nutritional adjuvant, not only because of the nutritional factors it contains, but also because of its tonic effect and stimulating action on the appetite. It hastens convalescence and helps overcome lassitude, fatigue and malaise. Furunculosis and inflammatory or ulcerative lesions of the mucous membrane may yield also to Liver and Yeast therapy.

Liver and Yeast Concentrate is absorbed rapidly and its physiological stimulating effect is noted promptly.

THE ARMOUR LABORATORIES
(Armour & Company Ltd.)
HAMPDEN PARK, EASTBOURNE, SUSSEX
Telephone: Hampden Park 740 *Telegrams: Armolab Eastbourne*

Reproduced by permission of the Trustees of the Wallace Collection

Restoration of Repose
with

EQUANIL
(MEPROBAMATE)

an outstanding new drug to lessen tension, reduce irritability and restlessness, and to produce more restful sleep and generalized muscular relaxation.

Supplies:
Bottles of 20 and 250 x 400 mgm. tablets

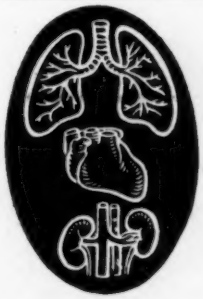
Wyeth

The word 'Equanil' is a registered trade mark

JOHN WYETH & BROTHER LIMITED
Clifton House, Euston Road, London, N.W.1

a **positive** *advance*

in theophylline therapy . . .



- A pure chemical compound — theophylline ethanoate of piperazine
- Soluble — Stable — Neutral
- Seven times less toxic than theophylline itself
- Freely tolerated orally for long-term therapy without nausea, vomiting or gastric disturbance
- Intramuscular injections of Etophylate are painless

Etophylate is indicated for the treatment of cardiac, respiratory and renal conditions

Clinical reports and samples gladly sent on request

ETOPHYLATE

Presentation : Tablets, 250 mg., in bottles of 25, 100 and 500. Suppositories, 500 mg., in boxes of 12 and 144. Ampoules, 500 mg. in 5 cc., in boxes of 6 and 50.

ETOPHYLATE is also available with phenobarbitone and papaverine

RONA LABORATORIES, 12-13, Molyneux Street, London, W.1 AMBassador 4437

Fourfold Control

in Peptic Ulcer and Hyperchlorhydria

HCl Secretion
Neutralization
Gastric Spasm
Sensory Anaesthesia

ALOCOL COMPOUND is a new preparation formularized to provide comprehensive management of causal and symptomatic disturbances in the treatment of hyperchlorhydria and its manifestations, including gastric and duodenal ulcer.

Formula each Tablet		*ALOCOL COMPOUND tablets effect*
'Alocol' (Coll. Alumin. Hydroxide)	11.58 gr.	antacid protection
Ext. Belladon. Sicc. B.P.	0.075 gr.	diminished secretion
Papaverine Hydrochlor. B.P.	0.31 gr.	reduced motility
Benzocaine B.P.	0.31 gr.	sensory anaesthesia

Alocol Compound thus provides the advantage of fourfold control—reduction of causal hyperacidic flow, and its neutralization; alleviation of symptomatic hypermotility and pain.

Packs and Prices to Pharmacists :

Bottle of 50,
2/11d. *plus* 10½d. P.T. ;
Bottle of 250,
12/6d. *plus* 3/9d. P.T.;
Bottle of 500,
23/9d. *plus* 7/1½d. P.T.

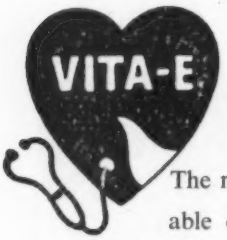
ALOCOL *Compound*

M.388

PERMISSIBLE ON N.H.S. SCRIPTS

Professional sample on request from Medical Dept.

A. WANDER LIMITED 42 UPPER GROSVENOR STREET, LONDON W.1.



Alpha tocopherol (Vitamin E) for CARDIOVASCULAR-RENAL DISEASES

The natural vitamin E available only since 1948 must not be confused with the wheat germ oil in use before that date with its limitations as to potency and stability.

The natural vitamin E of today comprises a concentrate distilled from the oils of cottonseed, palm, soya bean, etc.

The standard laid down by the League of Nations is that 1 international unit = 1 mgm. of d.l. *alpha* tocopheryl acetate.

The VITA-E Gelucap (75 i.u.) heads the list of brands approved by the Vitamin E Society and is that recommended by the Shute Foundation for Medical Research and used with such conspicuous success at the Shute Institute.

LITERATURE ON REQUEST

Sole Manufacturers:

THE BIOGLAN LABORATORIES LTD.
HERTFORD, HERTS, ENGLAND.

Specialists in Hormones and Vitamins

The Arithmetic of Peptic Ulcer Treatment

The **anticholinergic** is 'Merbentyl'*—*free from side-effects.*

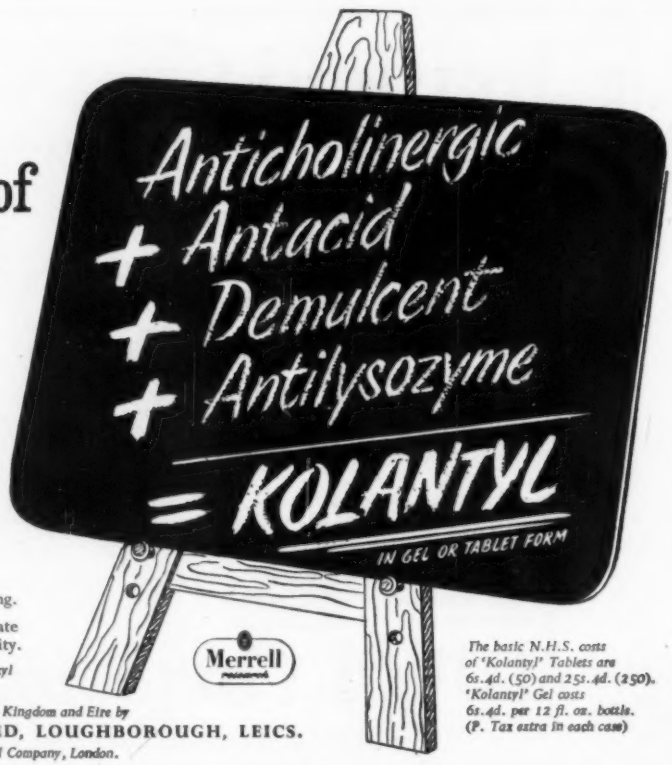
The **antacid** element is a combination of Magnesium Oxide (*quick*-acting, *laxative*) with Aluminium Hydroxide (*long*-acting, astringent).

N.B. *'Kolantyl' makes unnecessary the separate administration of antacids and anticholinergics.*

The **demulcent** is Methylcellulose—a protective coating to promote rapid healing.

The **antilysozyme** is Sodium Lauryl Sulphate—to inhibit lysozyme and pepsin over-activity.

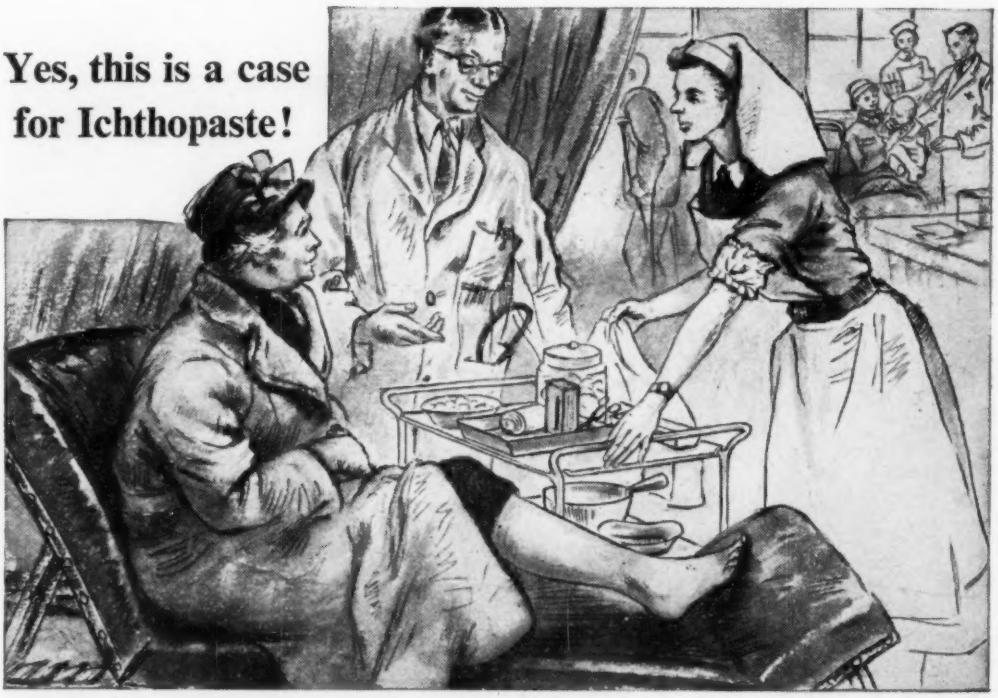
* *'Merbentyl' brand diethylaminocarbethoxybicyclohexyl hydrochloride.*



The basic N.H.S. costs of 'Kolantyl' Tablets are 6s.4d. (50) and 25s.4d. (250). 'Kolantyl' Gel costs 6s.4d. per 12 fl. oz. bottle. (P. Tax extra in each case)

distributed in the United Kingdom and Eire by
RIKER LABORATORIES LIMITED, LOUGHBOROUGH, LEICS.
for the Wm. S. Merrell Company, London.

Yes, this is a case for Ichthopaste!



Ulceration of the leg with associated eczema . . . yes, this is a case for Ichthopaste! But this is only one of the complete range of Smith & Nephew paste bandages available (on E.C.10) to the Medical Profession. The paste content of these bandages is particularly high, being four times the weight of their fabric base.

Ichthopaste

ZINC PASTE AND ICHTHAMMOL BANDAGE B.P.C

This bandage contains 2% of Ichthammol. It is indicated for eczematous conditions associated with leg ulceration, particularly when the eczema is of the weeping type. The bandage never sets harder than its original spongy state which gives a resilient dressing. An Elastocrepe or Elastoplast bandage may be applied to give firm elastic support.

Viscopaste

ZINC PASTE BANDAGE B.P.C

A zinc paste bandage which requires no preliminary heating and is ready for immediate use on removal of the waterproof wrapper. Viscopaste sets quickly, forming a thin shell and is indicated for eczematous conditions and also as a support for the leg following the removal of P.O.P. casts.

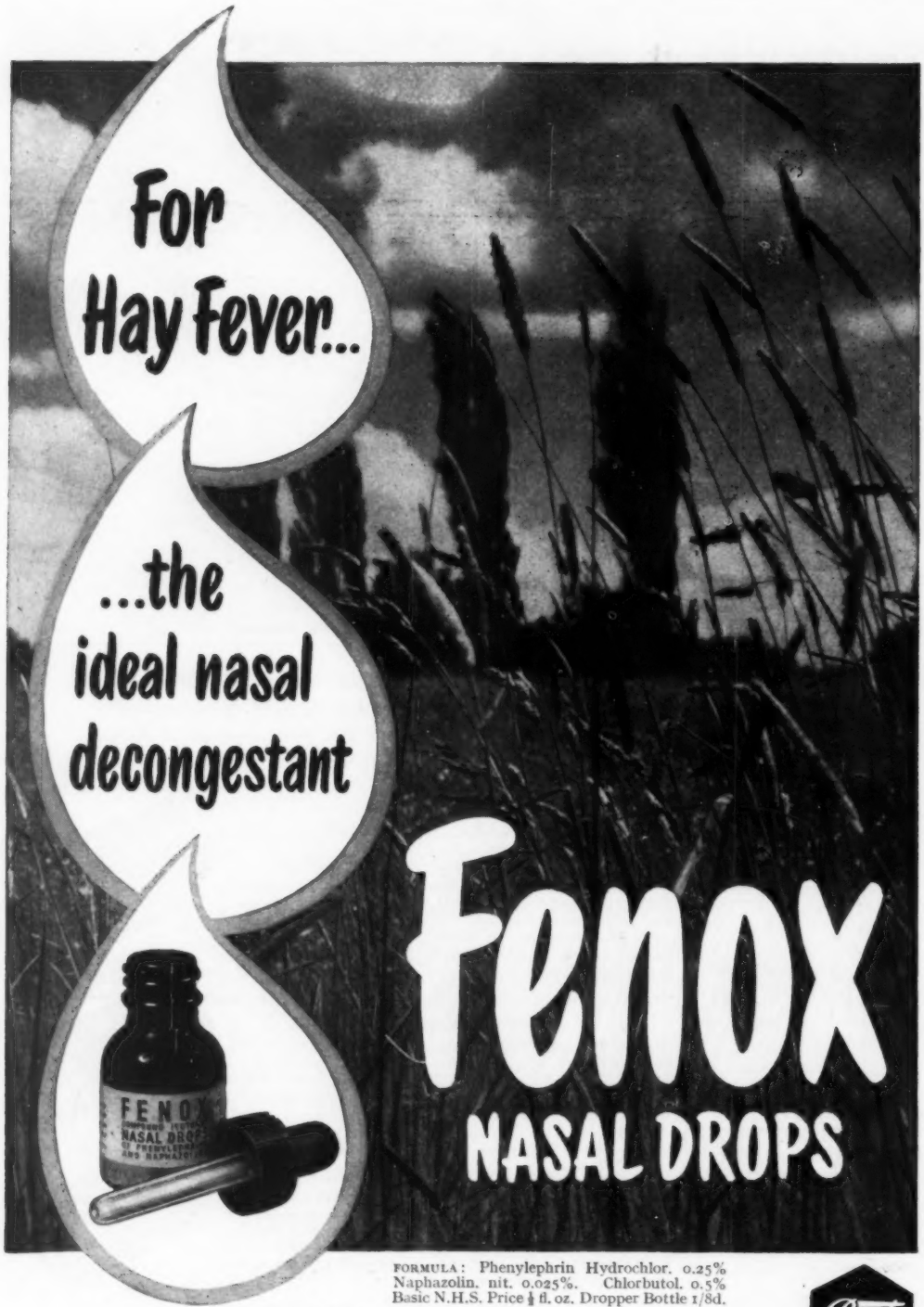
COLTAPASTE

ZINC PASTE AND COAL TAR BANDAGE B.P.C

Made from light cotton fabric, evenly impregnated with a water miscible coal tar zinc oxide paste. Coltapaste is indicated for the dry, scaly, itching type of eczema associated with varicose conditions, infantile eczema and neurodermatoses. Here is an ideal medium for the application of prepared coal tar to the skin, wherever its use is indicated.

S&N **SMITH & NEPHEW LIMITED**

WELWYN GARDEN CITY · HERTS



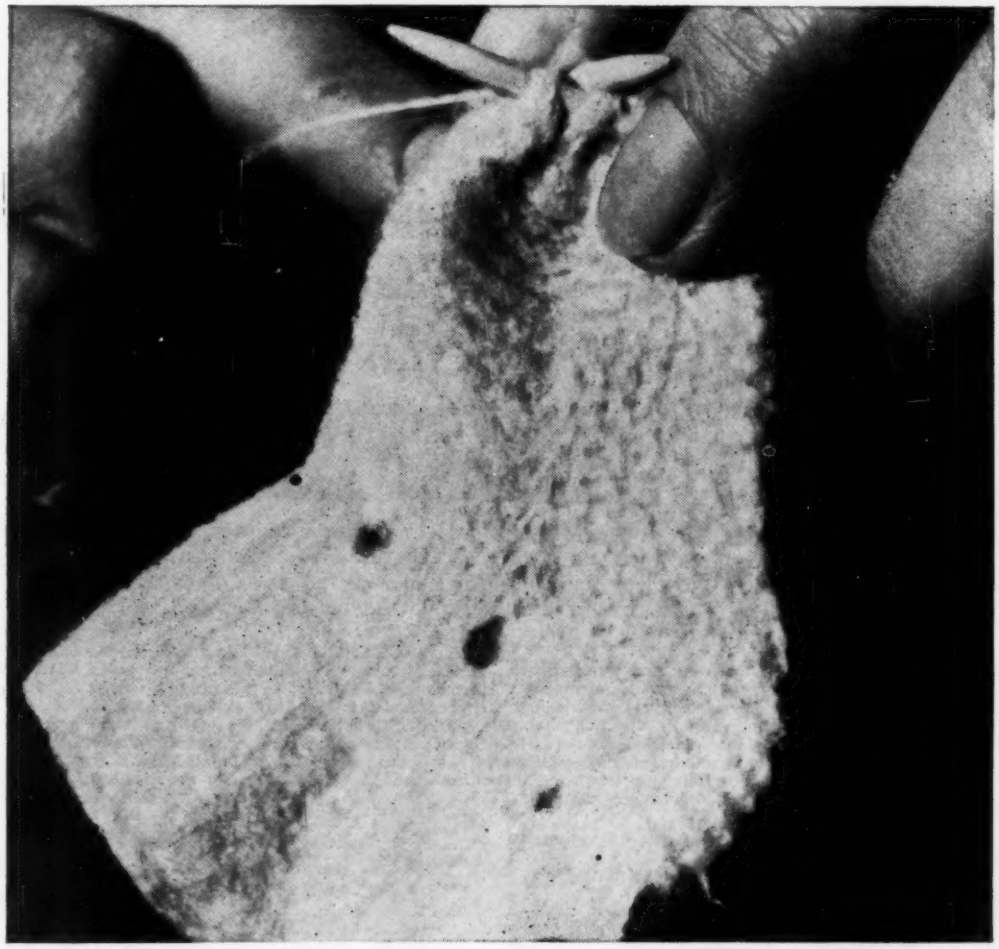
FORMULA: Phenylephrin Hydrochlor. 0.25%
Naphazolin. nit. 0.025%. Chlorbutol. 0.5%
Basic N.H.S. Price ½ fl. oz. Dropper Bottle 1/8d.

Literature and further information obtainable from

BOOTS PURE DRUG COMPANY LIMITED · NOTTINGHAM · ENGLAND

Boots

5234



Pregnavite

GUARDIAN OF MATERNAL WELL-BEING

A vitamin-mineral supplement designed to ensure that the special nutritional requirements of pregnancy are adequately supplied.

Dispensing packs of 1,000. *Basic price to N.H.S. 1,000 tablets 32/9.*

VITAVEL SYRUP *for children*

regular dosage is no problem when a vitamin supplement tastes as temptingly as VITAVEL SYRUP.

Basic Price to N.H.S. 6 fl. ozs. 2/6; 40 fl. ozs. 16/-

BEMAX *for all ages*

the richest natural vitamin-protein-mineral supplement, suitable for all cases of debility.

plain and chocolate-flavoured

VITAMINS LIMITED (DEPT. B.4) UPPER MALL, LONDON, W.6

Drip therapy without a tube

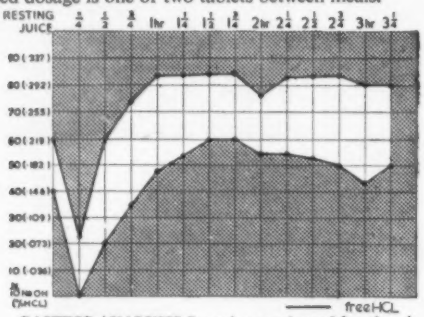
NULACIN

In the past, the successful treatment of many cases of peptic ulceration demanded hospital conditions. Now, by means of Nulacin Tablets, it is possible to control gastric hyperacidity without any inconvenience to the patient. By using Nulacin Tablets as directed, an ambulant patient can obtain all the advantages of intragastric milk-alkali drip therapy.

INDICATIONS

NULACIN tablets are indicated whenever neutralization of the gastric contents is required: in active and quiescent peptic ulcer, gastritis, gastric hyperacidity.

Beginning half-an-hour after food, a NULACIN tablet should be placed in the mouth and allowed to dissolve slowly. During the stage of ulcer activity, up to three tablets an hour may be required. For follow-up treatment, the suggested dosage is one or two tablets between meals.



GASTRIC ANALYSIS Superimposed gruel fractional test-meal curves of five cases of duodenal ulcer

BIBLIOGRAPHY

The Control of Gastric Acidity *Brit. Med. J.*, 26th July, 1952, **2:** 180-182

Medical Treatment of Peptic Ulcer, *Med. Press*, 27th February, 1952, **227:** 195-199

Notes on Remedial Agents, *Med. Rev.*, September, 1952, **46:** 162

Discussion on Peptic Ulceration, *Proc. Roy. Soc. Med.*, May 1953, **46:** 354

The Effect on Gastric Acidity of "Nulacin" Tablets, *Med. J., Aust.*, 26th November, 1953, **2:** 823-824

Control of Gastric Acidity by a New Way of Antacid Administration, *J. Lab. Clin. Med.*, 1953, **42:** 955

Further Studies on the Reduction of Gastric Acidity, *Brit. Med. J.*, 23rd January, 1954, **1:** 183-184

Clinical Investigation into the Action of Antacids, *The Practitioner*, July, 1954, **173:** 46

Management of Peptic Ulceration in General Practice, *Med. World*, December, 1954, **81:** 591-601

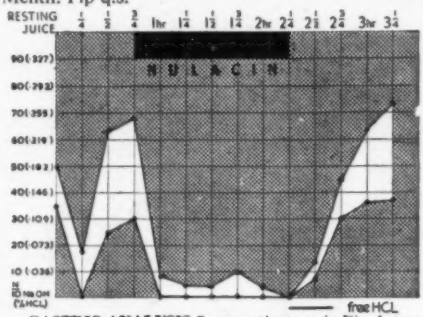
Ambulatory Continuous Drip Method in the Treatment of Peptic Ulcer, *Amer. J. Dig. Dis.*, March, 1955, **22:** 67-71

Notes on Remedial Agents, *Med. Rev.*, October, 1955, **49:** 142

Antacids in Peptic Ulcer, *The Practitioner*, January 1956, **176:** 103

NULACIN tablets are not advertised to the public, have no B.P. equivalent, and may be prescribed on E.C.10. The dispensing pack of 25 tablets is free of Purchase Tax. (Price to pharmacists is 2/-.) Also available in tubes of 12.

NULACIN tablets are prepared from whole milk combined with dextrins and maltose, and incorporate Magnesium Trisilicate 3.5 grs.; Magnesium Oxide 2.0 grs.; Calcium Carbonate 2.0 grs.; Magnesium Carbonate 0.5 grs.; Ol Menth. Pip q.s.



GASTRIC ANALYSIS Same patients as in Fig. 1, two days later, showing the striking neutralizing effect of sucking Nulacin tablets (3 an hour). Note the return of acidity when Nulacin is discontinued

NULACIN *is available throughout the British Commonwealth, in the U.S.A., and many other countries. It is known as NULACTIN in Canada and Sweden.*

HORLICKS LIMITED
Pharmaceutical Division
Slough, Bucks.

The
ELECTRIC BLANKET in the TUBE

FINALGON Regd. Trade Mark
OINTMENT

Produces a glowing feeling of warmth
which lasts for hours
and relieves rheumatic pain

Tube of 20 g.

COMPOSITION :
Nonylic acid vanillylamide 0.4% and
Nicotinic acid-β-butoxyethyl ester
2.5% in a suitable ointment base
5073/E

LEWIS LABORATORIES LTD., LEEDS 9

A Shooting Party at Lunch

This picture, by an unknown illustrator, recalls the large outdoor compositions of Watteau, which it resembles in revealing the Eighteenth-Century French preoccupation with extravagant *al fresco* gatherings.

One looks in vain for any evidence that the "shooting" has produced results. Of the social success of the consequent junketings, however, there can be no doubt at all.

Eating Out...

Eating away from home is always more or less hazardous to the hyperacid patient.

Portable medication is, in the patient's untutored hands, scarcely less risky; indiscriminate use of the many alkaline remedies within easy purchase often does more harm than good.

For the occasional or habitual dyspeptic alike, PRODEXIN affords, in a convenient and palatable tablet, a means of checking hyperacidity by regulating gastric *p*H at a safe and constant level for long periods.

Packings

Cartons of 30 individually wrapped tablets and dispensing packs of 240 tablets.

Basic N.H.S. cost of 240 tablets: 30s. 4d.

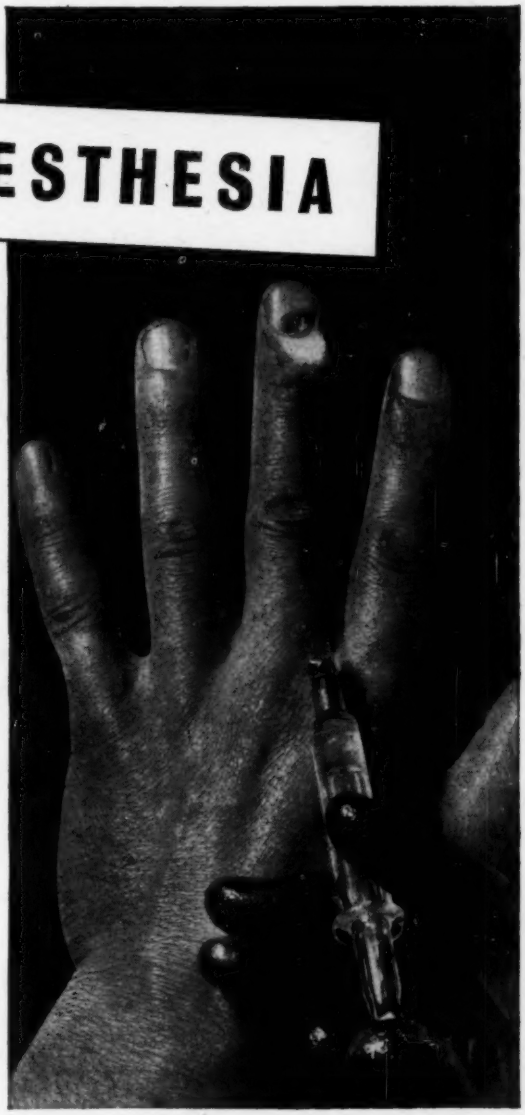
Each Prodexin Tablet contains

Aluminium glycinate	0·9 gm.
Light magnesium carbonate	0·1 gm.

PRODEXIN

C. L. BENCARD LTD.
Park Royal, London, N.W.10.

LOCAL ANAESTHESIA



INFILTRATION ANAESTHESIA demands a satisfactory spread of anaesthetic solution. It is especially valuable in the outpatient department in cases where general anaesthesia is contra-indicated.

A CLEAR CASE FOR HYALASE, the enzyme hyaluronidase.

HYALASE greatly enhances the spread and absorption of the anaesthetic. It can be easily combined with the local anaesthetic with or without adrenaline, producing a greater area of anaesthesia of satisfactory duration.

HYALASE can be successfully applied whenever infiltration anaesthesia is the method of choice.

FULLY-DESCRIPTIVE LITERATURE is available and a Technical Information Service is always at your disposal.

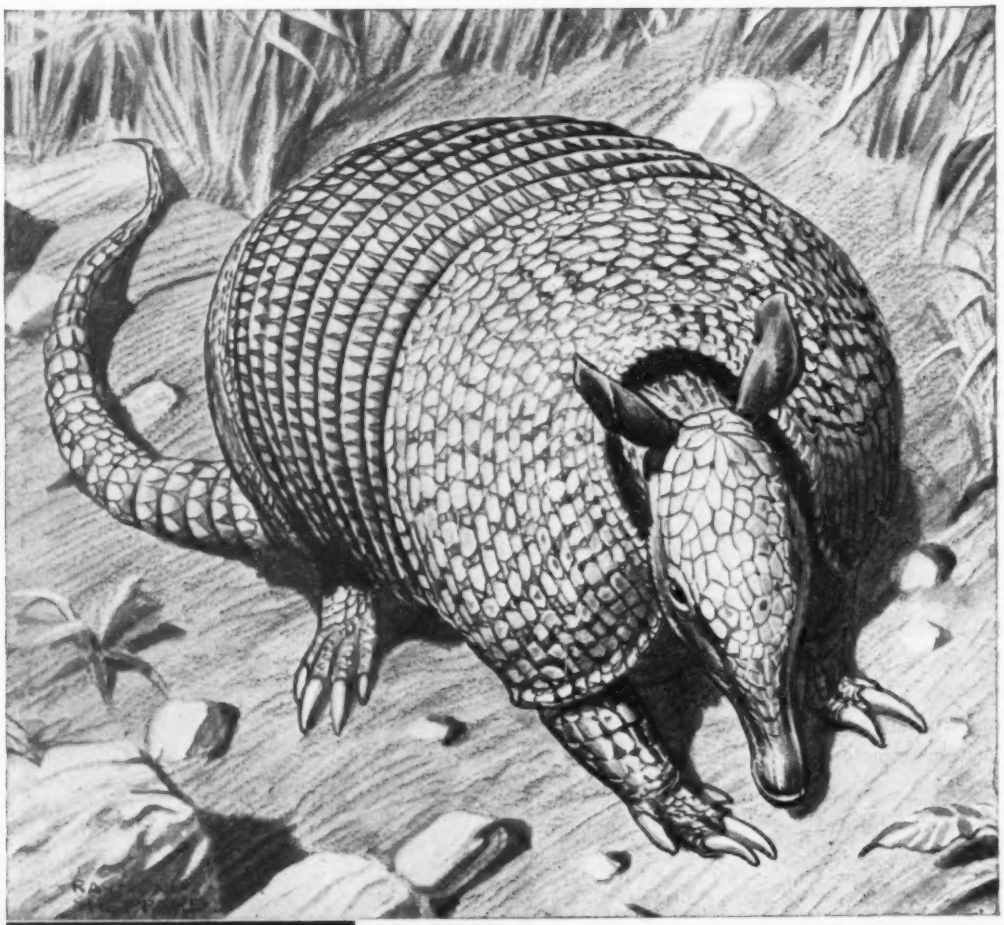
A clear case for HYALASE

TRADE MARK

BENGER LABORATORIES LIMITED · HOLMES CHAPEL · CHESHIRE

A BENGER PRODUCT

H.9. (REV)



Nature's defences...

...for animals The Armadillo, a harmless inoffensive mammal, has a full measure of Nature's most predictable defences. Foremost is the remarkable rapidity with which it can burrow into the ground; next comes the speed with which it runs despite its short legs; third, are its acute senses of smell and hearing; and last but not least, comes its characteristic protective armour which proves a powerful defence when the Armadillo rolls up hedgehog fashion.

...for humans Nature also provides predictable defences for man. In one of these — TERRAMYCIN, a broad-spectrum antibiotic derived from a tiny wrinkled mould found in the soil—she has provided man's most predictable means of defence against microbial attack. Effective in more than 100 infections, TERRAMYCIN with its rapid anti-microbial action and fewer side effects ensures a more positive defence against more organisms than any other anti-infective agent.

TERRAMYCIN* SF* (combined Terramycin and specific nutrients) is available to fortify the patient and, at the same time, to fight infection.

Terramycin*

Pfizer WORLD'S LARGEST PRODUCER OF ANTIBIOTICS

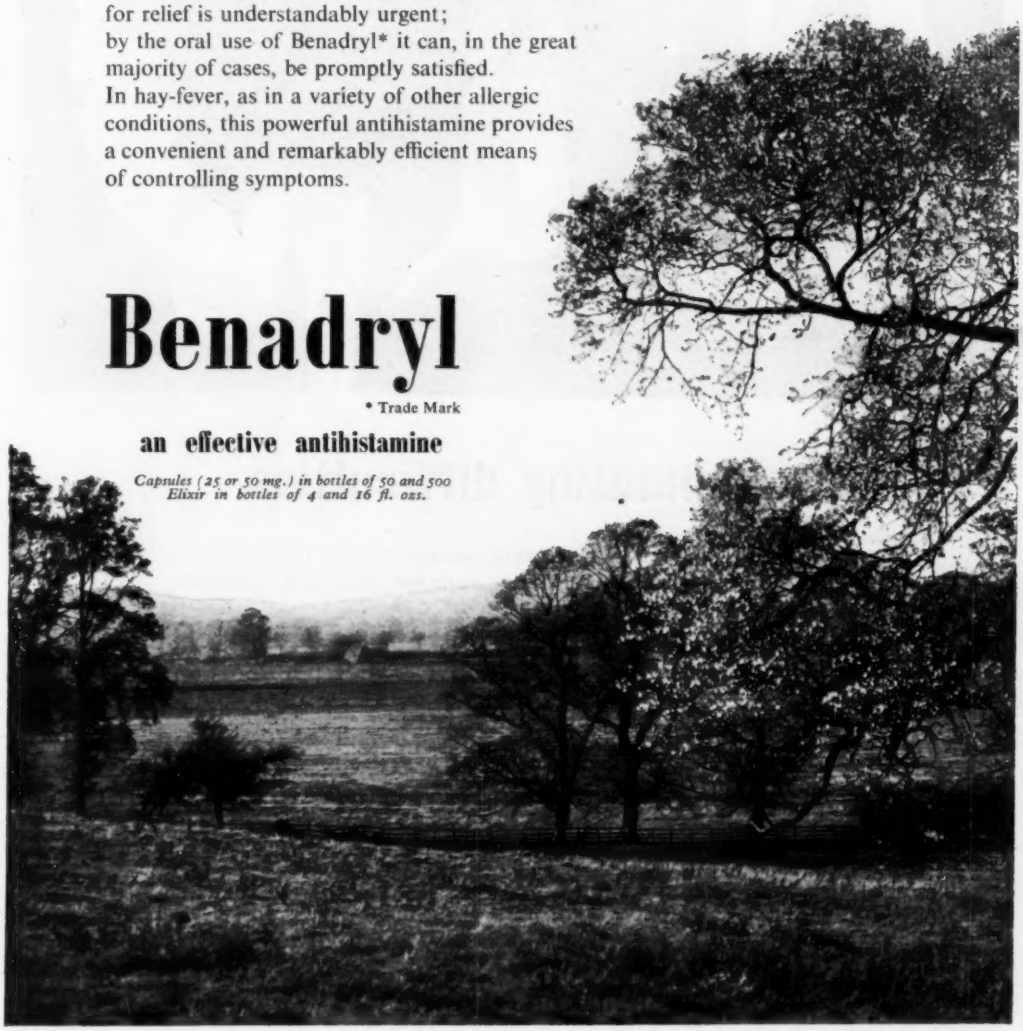
PFIZER LTD., FOLKESTONE, KENT

* *Trade Mark Chas. Pfizer & Co. Inc.*

Nothing so active is as that which least seems so

Francis Thompson

A peaceful countryside scene: but an active source of intense discomfort for all those susceptible to hay-fever, for now is the time of the year when invisible air-borne pollens begin to take their toll. Incapacitated by continual weeping, sneezing and nasal congestion, the hay-fever patient's desire for relief is understandably urgent; by the oral use of Benadryl* it can, in the great majority of cases, be promptly satisfied. In hay-fever, as in a variety of other allergic conditions, this powerful antihistamine provides a convenient and remarkably efficient means of controlling symptoms.



Benadryl

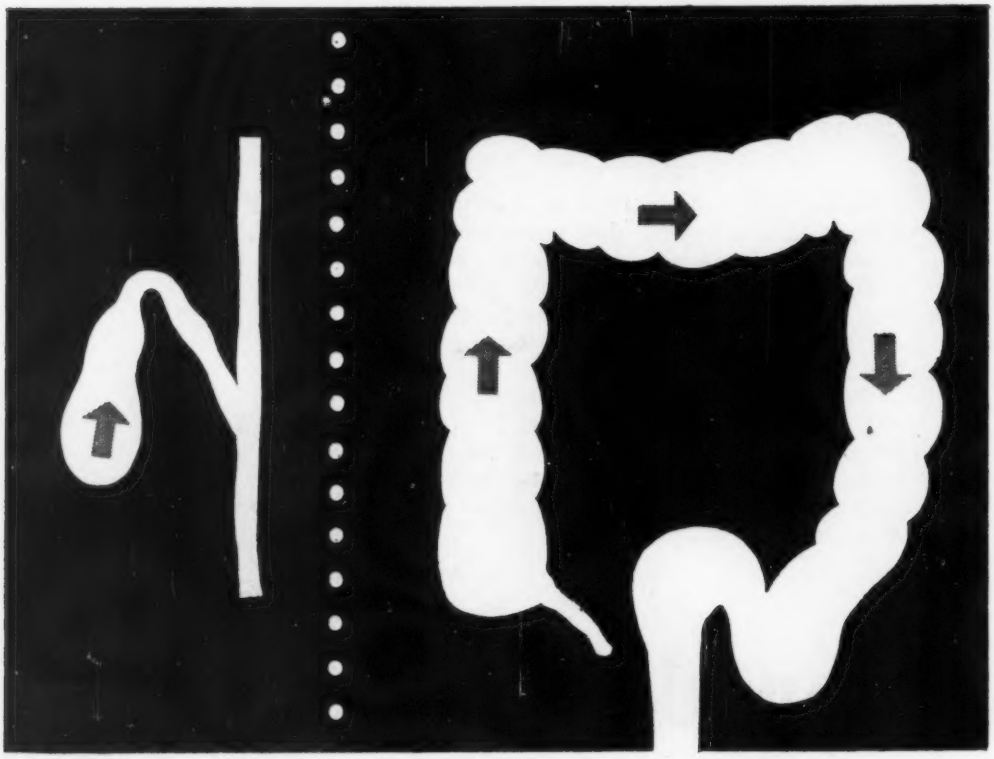
* Trade Mark

an effective antihistamine

Capsules (25 or 50 mg.) in bottles of 50 and 500
Elixir in bottles of 4 and 16 fl. ozs.

PARKE, DAVIS & COMPANY, LIMITED (Inc. U.S.A.) HOUNSLOW, MIDDLESEX Tel: Hounslow 2361.

485



eliminating difficulties

Difficulties in elimination are often associated with hepatobiliary disturbances. The resultant biliary stasis can itself lead to further intestinal sluggishness.

Veracolate is formulated to deal with both aspects of this problem. First, Veracolate contains bile salts which stimulate the production and flow of bile. Secondly, the phenolphthalein and cascara content of Veracolate encourage intestinal activity—thus helping to void the intestinal contents.

Active principles: Sodium taurocholate and glycocholate, 1.07 gr., ext. cascara sagrada, 1.00 gr., phenolphthalein 0.50 gr., oleoresin capsicum 0.04 gr.

Dose: 1 tablet 3 times a day or 2 at night.

Packing: In bottles of 50 and 100 tablets. Bottles of 500 tablets supplied to chemists for dispensing.

Veracolate

No Warner preparation has ever been advertised to the public.

WILLIAM R. WARNER & CO. LTD., POWER ROAD, LONDON, W.4.

Nutrition problem

If children had their own way, some strange diets would emerge. Most children are food-faddists with likes and dislikes that frequently lead to impaired nutrition. Insurance against such nutritional problems is adequately provided by a daily dose of the newly introduced VI-MAGNA SYRUP — specially formulated to correct inadequate intake or utilization of dietary vitamins. Its delicate orange flavour will appeal particularly to the food-faddist child, who can derive all the vitamins essential for nutritional well-being from ONE TEASPOONFUL DAILY.

Vi-Magna* Syrup

BRAND OF MULTIVITAMINS *Lederle*

Contains vitamins A and D made water-soluble for better utilization

Each teaspoonful contains:

Vitamin A	5000 I.U.	Ascorbic Acid (C)	75 mg.
Vitamin D	500 I.U.	Niacinamide	20 mg.
Thiamine HCl (B_1)	3 mg.	Calcium pantothenate	1 mg.
Riboflavine (B_2)	2 mg.	Vitamin B_{12} as present in concentrated extractives from streptomyces fermentation	5 mcgm.
Pyridoxine (B_6) HCl	0.2 mg.		

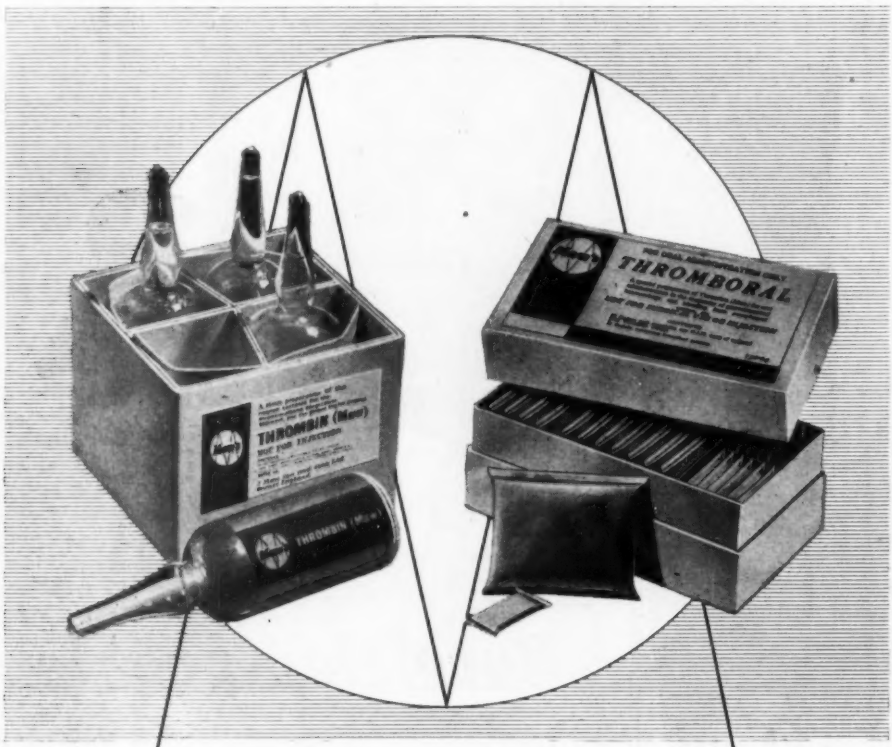
Bottles of 4 fl. oz. and 16 fl. oz.

* Regd. Trade-Mark

50 Lederle FIFTIETH ANNIVERSARY

LEDERLE LABORATORIES DIVISION

Cyanamid PRODUCTS LTD. · LONDON · WC2



Thrombin (MAW)

For topical use in the immediate arrest of haemorrhage and for diagnostic use in obstetrics.

The haemostatic of choice in surgical or dental procedures where bleeding is from capillary vessels, or of the oozing type. Of particular value as a physiological adhesive in plastic or cosmetic surgery and for the rapid diagnosis of afibrinogenaemia in cases of excessive haemorrhage, post partum or in abortion. THROMBIN (Maw) has been proved to be of considerable value in thoracic surgical operations such as the decortication of the empyema. Presented in cartons of 2 ampoules x 200 N.I.H. Units, 6 ampoules x 50 N.I.H. and 1 ampoule x 5,000 N.I.H. Units, each with diluent.

Thromboral

A treatment for Haemorrhagic ulcers occurring in the alimentary canal.

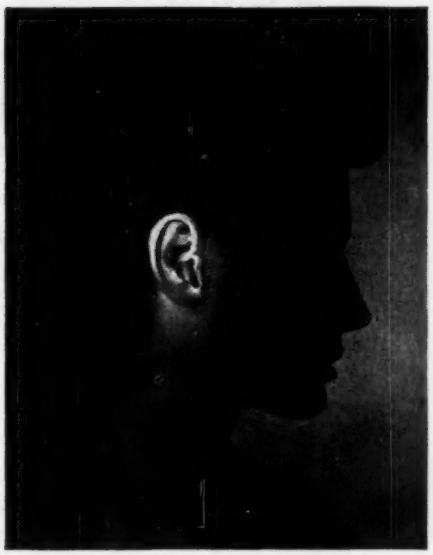
For control of haemorrhagic complications of peptic and duodenal ulcers; bleeding from ruptured oesophageal varices; denuded buccal ulcer and cases of epigastric distress exhibiting signs of internal haemorrhage, especially where the patient's age or physical condition makes surgical intervention undesirable. THROMBORAL contains active THROMBIN in substantial doses, the instantaneous effect of which is preserved by reduction of the pH of the gastric mucosa. Natural physiological coagulation occurs at the site of bleeding. THROMBORAL is presented as a complete treatment for oral administration over 24-hours.

Maw's

S. Maw Son and Sons Limited · Barnet · England

EAR WAX

Removed this easy way



The removal of wax from the external auditory meatus has, in the past, normally entailed attendance by the patient for diagnosis and for the prescription of a suitable loosening agent, and a second attendance a few days later for syringing. Now, by the use of Cerumol Ear Drops, wax can be removed in most cases at one visit. A few drops of Cerumol can be instilled into the ear and, while another patient is being attended to, the soft cerumen dissolves and the harder wax disimpacts. The wax can then be removed by gentle syringing or with cotton wool. The wax may even be found to run out of the ear on its own accord, in which case patients themselves may instil Cerumol at home, obviating further attendances. Cerumol is anti-bacterial, non-irritating and harmless to the lining of the external auditory meatus or the tympanic membrane. Cerumol is included in Category No. 4 of the M.O.H. classified list and may be prescribed on N.H.S. Form E.C.10.

CERUMOL
Regd TRADE MARK

EAR DROPS

for the easier removal of wax

Distributors in U.K.
TAMPAX LIMITED, BELVUE ROAD, NORTHOLT, GREENFORD, MIDDLESEX. Telephone : WAXlow 2244

If you wish to test for yourself and have not received recently a 10 c.c. vial please write or telephone direct to :

LABORATORIES FOR APPLIED BIOLOGY LIMITED,
91, AMHURST PARK, LONDON, N.16 Telephone STAmford Hill 2252

PACKS for Surgery Use: 10 c.c. vial — separate dropper included.
(Basic N.H.S. price 2/8.)
For Hospital Use : 2-oz. and 10 oz. bottles.

Improved intragastric therapy

WHENEVER WHOLE PROTEIN cannot be ingested, digested, absorbed or utilised, Casydrol (Oral)—predigested protein—may well speed recovery and hence discharge from hospital.

CASYDROL (ORAL) is half amino-acids and polypeptides and half lactose—the lactose helps to meet the caloric needs of the patient and spares the protein for tissue regeneration. Casydrol (Oral) is ideally suitable for administration by intragastric drip and is an advance on milk drip therapy.

CASYDROL (ORAL) *is classified in Category* I *and may be prescribed under the National Health Service.*

Casydrol

ORAL

A

BENGER

PRODUCT

BENGER LABORATORIES LIMITED · HOLMES CHAPEL · CHESHIRE

After rheumatic fever . . .

WHICH WAY?

Rheumatic fever is still one of the greatest causes of chronic disability and early death. The risk of a recurrence has been estimated to be 60-75% in the first three years after an initial bout.* Prophylaxis with a sulphonamide, 1 tablet twice daily throughout the dangerous period which follows an attack, can reduce this risk to 5% or even less.

Therefore, minimise the risk of relapse by prescribing a small daily dose of 'Sulphamezathine'. The outstanding characteristics of this sulphonamide are its low toxicity and cost. Prophylaxis with 'Sulphamezathine' costs (basic net cost to N.H.S.) approximately 10d. per week.

* (1946), *J. Pediat*, *28*, 296.

Well tolerated, safe, sure

'SULPHAMEZATHINE'

Sulphadimidine B.P. Trade Mark

IMPERIAL CHEMICAL (PHARMACEUTICALS) LIMITED, FULSHAW HALL, WILMSLOW, CHESHIRE
A subsidiary company of Imperial Chemical Industries Limited

Ph.646

OVER five years experience in general practice and in the hospital has established Chloromycetin* as a potent and reliable antibiotic. In many serious respiratory and genito-urinary tract infections it offers the best chance of success as the following reports indicate:

Acute Laryngotracheobronchitis January, 1955

Owing to its wide range of antibacterial activity, Chloromycetin "is the drug of choice in the treatment of laryngotracheobronchitis" . . . in which "the infecting organisms are either penicillin-insensitive or usually penicillin-resistant."

Med. Press 233:485, 1955

Septic Abortion May, 1955

In a review of 995 cases of septic abortion treated in a special puerperal sepsis unit, a number of cases were due to infection with coliform organisms or penicillin-resistant staphylococci. "Since 1951" state the authors "we have been impressed with the efficacy of Chloromycetin in this type of case."

Brit. med. J. 2:1239, 1955

Staphylococcal Empyema July, 1955

12 of 13 cases of penicillin-resistant staphylococcal pneumonia in infants and children, complicated by lung abscess and empyema, responded dramatically to Chloromycetin—"the most effective drug". Chloromycetin was indicated by *in vitro* sensitivity tests in all cases in this series.

Canad. M.A.J. 73:787, 1955

Acute Pyelonephritis in the Diabetic September, 1955

In a "condition which in most cases would otherwise be fatal", it is desirable to use an antimicrobial agent likely to be effective against the common urinary pathogens as well as organisms liable to produce secondary infection. "Chloromycetin offers the best chance of success and it is more likely to clear the infection with the first intensive course of treatment."

Canad. M.A.J. 73:956, 1955

CHLOROMYCETIN

the original Chloramphenicol

PARKE, DAVIS & COMPANY, LIMITED (Inc. U.S.A.) HOUNSLOW, MIDDLESEX
Telephone Hounslow 2361 * *Trade Mark*

436

A wider field in Local Anaesthesia

For a more consistent and rapidly-produced field of local anæsthesia, Rondase—the spreading factor—can be used with any infiltration anæsthetic.

In the manipulation and reduction of fractures this procedure does away with the need for a general anæsthetic.

In the treatment of mild and moderate sprains of the limb-joints Rondase assists in producing anæsthesia and also in the dispersal of effusion.

In plastic surgery, anæsthesia of the donor area is assisted by Rondase; the addition of $\frac{1}{1000}$ adrenaline prevents systemic dispersal of the anæsthetic and demarcates the area anæsthetised.

Information on other uses for Rondase and fuller details of technique are available from the Medical Information Department.

RONDASE (HYALURONIDASE-EVANS)

Presentation: **Rubber-capped vials each containing 1000 i.u. in boxes of 6 and 25.**

EVANS MEDICAL SUPPLIES LTD.

LIVERPOOL EVANS MEDICAL LONDON

409

23

PENTOXYLON

endows the anginal patient with a happy, useful life...

'Pentoxylon'—combining two effective and reliable agents, 'Rauwiloid' and P.E.T.N. in one tablet—provides a more comprehensive therapy for angina pectoris than has hitherto been possible using a single preparation. 'Rauwiloid'—a purified and standardized alkaloidal extract of *Rauwolfia serpentina*—has pronounced tranquillizing, bradycardic and stress-relieving properties; P.E.T.N. (pentaerythrityltetranitrate) is a powerful, long-lasting coronary vasodilator.

'Pentoxylon' not only relieves the coronary spasm, but helps to *prevent* attacks—reducing the apprehension of the patient living in dread of the next onset of pain, and so checking the cycle at its commencement.

- ✻ *Reduces tachycardia*
- ✻ *Increases exercise tolerance*
- ✻ *Reduces nitroglycerin needs*
- ✻ *Allays apprehension and anxiety*
- ✻ *Lowers blood pressure when this is raised*

RIKER

Each 'Pentoxylon' tablet contains 'Rauwiloid' 1 mg. and P.E.T.N. (pentaerythrityltetranitrate) 10 mg. The usual dose is one tablet four times daily always *before* meals. Up to eight tablets daily are well tolerated.

Descriptive literature will be supplied on request.

'Rauwiloid' and 'Pentoxylon' are registered trade-marks. Regd. Users;

RIKER LABORATORIES LIMITED

LOUGHBOROUGH LEICS.

Antihistamines for old and young

When the contents of Pandora's Box were released, Hope alone remained. To the patient of allergic diathesis, threatened by a veritable Pandora's Box of ills, the antihistamines 'Histantin' and 'Actidil' represent far more than hope.
For adults 'Histantin' is the product of choice, giving prolonged relief with a minimum of side-effects.
The new quick-acting antihistamine, 'Actidil', exerts its effect for about 12 hours and is also notable for low incidence of side-effects. 'Actidil' Elixir has been specially formulated and clinically tried for the treatment of allergic conditions in children.

'HISTANTIN', *50 mgm., is issued in bottles of 25, 100 and 500 at list prices (subject to usual discount) of 6/6, 24/6, 110/-.*

'ACTIDIL' *compressed products of 2·5 mgm. in bottles of 25 and 500 at list prices (subject) of 6/6 and 110/-.*

'ACTIDIL' ELIXIR *in bottles of 20 fluid ounces, for dispensing, at a list price (subject) of 15/-.*

BURROUGHS WELLCOME & CO. *(The Wellcome Foundation Ltd.)* **LONDON**

Two weapons against Athlete's Foot

and other fungal dermatoses

The combined use of Mycil Ointment and Powder has proved to be highly effective in both prophylaxis and treatment of fungal dermatoses.

Mycil Ointment is formulated to ensure penetration of the active constituent, chlorphenesin, to the site of the infection.

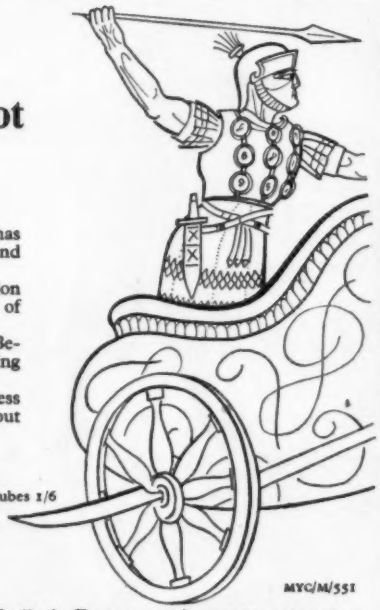
Mycil Powder, used alone, prevents reinfection. Because of its adsorptive properties it is useful in combating the effects of excessive perspiration.

Both preparations are non-mercurial and odourless and may be used over long periods, if necessary, without adverse effects.

'MYCIL' TRADE MARK

MYCIL OINTMENT in collapsible metal tubes 1/6
MYCIL POWDER in sprinkler tins 1/6
Basic N.H.S. prices

'MYCIL' Pessaries are available for treatment of trichomonal and fungal infections of the vagina.



MYC/M/551

THE BRITISH DRUG HOUSES LTD. (Medical Department) LONDON N.1

The secret of sleep . . .

in a capsule

Lilly

BARBITURATES

'SECONAL SODIUM'
Quick onset—short duration.
In 'Pulvules' ¾ gr. and 1½ grs.

'SODIUM AMYTAL'
Medium onset and duration.
In 'Pulvules' 1 gr. and 3 grs.

'TUINAL'
Quick onset—medium duration.
In 'Pulvules' 1½ grs. and 3 grs.

ELI LILLY & COMPANY LIMITED, BASINGSTOKE, HANTS

CHANGES IN MEDICAL EDUCATION *

JOHN R. ELLIS
M.B.E., M.A., M.D. Camb., F.R.C.P.
ASSISTANT PHYSICIAN TO THE LONDON HOSPITAL; SUB-DEAN OF THE LONDON HOSPITAL MEDICAL COLLEGE

CHANGES in medical education are of two types. Either they are made deliberately to improve it, or they arise incidentally from changes in medicine and its basic sciences or in the conditions of medical practice. Such secondary changes, as we may call them, are frequent and inevitable, but not always beneficial. Primary changes are necessary from time to time to incorporate new methods and techniques, but they are even more urgently needed to reorientate the educational processes to new objectives and to repair the damage done by secondary changes.

During the past half-century medical teachers and official bodies have made careful and repeated assessments of these changes, and there has been no lack of recommendations on the reform of medical teaching. Some of these have been heeded and put into effect, but in recent years there has been increasing evidence that the process of adaptation has broken down. Whilst most are aware of what is wrong, few are agreed on how to put it right. To quote from a recent report of the Royal College of Physicians: "An American observer lately said that in the past ten years no country has produced so many wise reports on the improvement of medical education as Great Britain, and no country has done so little about it." [1]

My purpose here is to review the changes in medical education—particularly during the past decade—and to consider the further changes now required.

Evolution of British Medical Education

Until about the middle of the past century the training for medicine was entirely by personal apprenticeship. It was in the literal sense a "training," primarily technical and wholly vocational. The method was not appreciably altered even by the grouping of students in hospitals. The relationship of teacher and taught became less close, but the student continued to learn by imitation of his master and by practice for and under him. He continued to learn everything that was practised and very little that was not.

In the second half of the century scientific advance led to a fundamental alteration in medical education by necessitating the inclusion of theoretical study: the scope of medicine enlarged so much that fitness to practise could no longer be achieved by a purely technical and vocational training, but needed also the discipline of the basic sciences. This was a fundamental and primary change, but its implications have never been fully recognised by the profession as a whole. Hence we have been pursuing an educational policy whose very purpose has been neither clear to all nor accepted by all. Because of this basic defect in our educational strategy, there has been no concerted effort on an agreed plan, and such facilities as we possess have not been properly applied.

The "Block System"

Whatever the reasons (and perhaps the English gift for compromise was not the least of them), we adopted a system of training divided into two parts, one largely theoretical and the other largely practical. This block system, very different from that which emerged on the Continent, continues to this day, the blocks being accurately described as preclinical and clinical. The objective during the preclinical period has been to lay the foundations for clinical practice. But with the progress of medical thought two weaknesses have been exposed. Firstly, the ancillary subjects added to the curriculum fifty years ago no longer provide a complete foundation; and secondly, the idea of a foundation has been taken too literally—i.e., as something that is laid down and allowed to dry. A more satisfactory concept would be that of girders which rise vertically through the whole structure.

Fifty years ago the idea of medical education being built up layer by layer was entirely reasonable. Even thirty years ago it seemed adequate, and Flexner, in his comparative study of medical education throughout the world, described it in 1925 as the best that he had seen. But its deficiencies were beginning to be apparent and he was critical of its application. He thought that the concept of normality gained by the student in the preclinical period suffered from the vocational character of the teaching. (It should be remembered that at this time the link between preclinical and clinical staff was very close: some of the heads of preclinical departments had themselves been engaged in medical practice and most of the junior preclinical teachers were practising clinicians.) Similarly in clinical medicine he condemned the utilitarian approach: "Listening to a succession of bedside expositions," he wrote, "not infrequently quite chatty in substance and tone, one is struck by the positive note, . . . rarely is the unknown, the problematic, the profounder question, the historic background, attended to." [2] Yet he felt that the British student learned clinical medicine as an intelligent apprentice, one who "in virtue of previous training, is soon capable of orderly procedure in the analysis of symptoms, the arrangement of data, and the drawing of tentative conclusions." He recognised that the supreme strength of British medical education still lay in the careful inculcation of clinical method, and he saw too that this came less from teaching than from constant practise upon patients—freedom to practise clinical method, while having an obvious obligation to the patient as an incentive for doing so. The British student was then "indeed part of the functioning machine."

The Effects of the Growth of Medicine

In the thirty years since that time our educational system has altered very little—but our educational practice has been continuously subjected to *secondary* changes, so that it has altered almost out of recognition. Most of these changes have arisen from the growth of Medicine.

Preclinical teaching.—Scientific advance has added enormously to knowledge: the so-called basic sciences have swollen, reproduced as it were by binary fission, and swollen again. In anatomy a whole new field of living structure has been opened up in twenty years and the dry bones of topographical anatomy have been agitated by the study of embryology. Physiology has spread so far and wide that it is not clear what is left at the centre. Like biochemistry, and indeed anatomy, it runs from the foundations upwards through the whole medical edifice. These are no longer subjects of which some elementary knowledge is useful for the comprehension of practical techniques—they are processes of thought which are indispensable if the mind is to be brought to bear efficiently upon any medical problem, whether that of an individual patient or of research.

But the student's experience of the preclinical subjects remains cramped between the old limits, not only of time but also of examinations. Confined and isolated between the first and second professional examinations,

* The Goulstonian lectures for 1956 delivered before the Royal College of Physicians on Jan. 17 and 19.

1. Royal College of Physicians: Second Interim Report of Medical Teaching Committee. *Lancet*, 1955, ii, 133.

2. Flexner, A. Medical Education. New York, 1925; pp. 58, 241.

hopelessly hurried and crowded, this experience has become dedicated to the 2nd M.B. It is no longer a foundation, either for practical purposes or for an education. Preclinical teachers struggle hard against the difficulty of their scant numbers and their increasing separation from clinical work. More enlightened perhaps than many of their predecessors, they try to inculcate an understanding of science and to stimulate their students' minds. But outside the older universities and the schools that provide facilities for a B.SC. degree, these efforts influence only a minority of students. Even where attempts have been made to reduce and select the content of the preclinical curriculum and where integration in teaching has been achieved, the examination is still the student's main objective and incentive; and unfortunately the student's concept of the examination is very different from the examiner's.

I regard the second professional examination as one of the main reasons for our failure to adapt medical education to changing conditions and requirements. It presents an official barrier to the integration of clinical and preclinical studies. It imposes a time-limit on preclinical studies so that the introduction of new basic disciplines such as psychology and social science is impracticable. It prevents a reduction in factual and non-essential teaching such as is necessitated by dissection of the whole body. Integration with the basic premedical sciences is likewise prevented, and this in turn has led to over-teaching of these subjects in the period which should still be devoted to general education. The most serious indictment, however, lies in the attitude of mind it produces in the majority of students. Because so many facts have to be assimilated in so little time, leisure has been eliminated. If there is no leisure there is no time for thought; and if there is no thought there is no meaning in terms of subsequent experience. Too many students still believe and hope they have "finished" with anatomy and physiology after passing the 2nd M.B.

But science itself has ignored the rigid barriers of the educational system. Though medicine has not and never will become an exact science, it is now impossible for its practice to be good without the application of scientific method. The effectiveness of this application will always depend on the doctor's understanding, imagination, sympathy, and moral integrity; but these attributes cannot make up for the absence of a scientific outlook. Thus, to cope with the increasing complexity of medicine over the past twenty-five years, a sound clinical training demands a preclinical education, not merely as good as in the past, but considerably better.

Clinical teaching.—In clinical medicine factual teaching cannot be neglected or even selected to the same extent as it may be in the preclinical stages; for pathology, diagnosis, and treatment have a large factual content, and the student must at some stage strive to become acquainted with the whole truth in the branch of medicine he proposes to follow. Yet some selection must be made, since nobody can now familiarise himself with the whole of medicine. Professional competence and the advancement of knowledge both demand specialisation, and postgraduate training is therefore necessary for any kind of medical practice—including general practice, which is one of the most difficult (and important) specialties.

We might have expected, therefore, that for all forms of practice clinical training would have been separated into undergraduate and postgraduate stages; but there has been no real effort to make clear what should be done in each. In face of a dual need of a more scientific approach and of more selective presentation of factual knowledge, the undergraduate curriculum appears to have had only one consistent objective—to remain comprehensive.

Specialisation Breeds Comprehensive Training

The reason for this is not hard to find. So long as medical education adheres to the structure and organisation of fifty years ago, specialisation will continue to enforce an increasingly comprehensive training. Almost every specialty claims some portion of the student's time, and the process is cumulative because there is less and less overlap between special departments. Thus the student's clinical experience is increasingly fragmented, and though it is superficially wide it is seriously lacking in depth.

From this stems a further trouble: fragmented and distorted clinical experience, combined with an increase in teachers but a decrease in supervision, steadily undermines the apprenticeship system on which depends not only the vocational study of medicine but also the technical training in clinical method.

It is frequently said that, if presented with a wide field of clinical experience, the good student will select for himself. But there are different types of experience appropriate to different stages of development. The student naturally feels that he would like to know everything; and the comprehensive final examination —for many students an external one—leaves him with little choice of what to leave out.

It is apparent, therefore, that in both the preclinical and the clinical fields rapid expansion of knowledge, with all the consequent changes in medical practice, have produced serious changes in medical education largely because our system of teaching and our method of examining have by comparison remained static.

The Past Twelve Years

These observations are not new. About a decade ago there appeared a number of detailed and objective assessments of the state of medical education. All stressed the same things—the need for a basic rather than a comprehensive curriculum and the need to give undergraduate students an education, not merely a training, in medicine.

Few reports have made this more clear than that of the 1944 Planning Committee of the Royal College of Physicians.[3] "Medical Education" said this report, "is directed towards two objectives which may be termed educational and vocational."

> "In education we seek to train the student so that he can collect, analyse and interpret facts for himself, to observe and to understand what he observes. It is an objective common to all University education in natural science, and in pursuing it, medical education is peculiar only in selecting material for study that is relevant to the problem of disease. The goal of this aspect of medical education is to produce men who are equipped to learn both by their own experience and that of others, and who will continue to develop even when they have left the school in which they were taught. Vocational training, on the other hand, aims at giving the student such a basis of knowledge as will enable him to practise Medicine on his own account. It seeks to ensure that the medical graduate knows enough to recognise the common forms of disease, and how they are treated."

This committee drew attention to the inevitable conflict between the two objectives. Describing the overcrowding of the curriculum by the attempt to include it in all knowledge before qualification, it said:

> "The result is that to an increasing degree during the clinical period the student's time and energy are taken up in absorbing an enormous mass of facts, so that he can give no thought to the scientific principles underlying Medicine. Students of exceptional ability may survive the ordeal with no more serious consequences than fatigue, but the average man usually seeks the easiest way out of his impasse and accepts that the primary object of his training is to absorb as much information as possible."

3. Royal College of Physicians: Planning Committee's Report on Medical Education, 1944.

As so much of the factual knowledge acquired in this manner and for examination purposes is rapidly forgotten, the committee concluded that " while it seems that the educational has been sacrificed to the vocational objective, in fact, neither has been gained." This indeed summarises the situation.

Similar observations were made by a committee of the British Medical Association, and at greater length in the far-reaching study by the Interdepartmental (Good-enough) Committee on Medical Schools. Before considering the changes they proposed and the action that has been taken, it is important to continue the story of changing conditions over the past ten years; for these have had if anything a more serious influence on medical education than all that went before.

The Effects of the National Health Service

The National Health Service has had an entirely unexpected effect on medical education. It is quite clear, both from the special position given to the teaching hospitals and from the Ministry of Health's memorandum in 1950 on the Development of Consultant Services,[4] that the intention was to give high priority to the training of doctors. The boards of governors of teaching hospitals are in fact required to provide special facilities for the clinical instruction of undergraduates, in accordance with the educational policy of the university or medical school concerned.

In the event, however, it has proved financially impossible to implement the plan for establishing consultant centres elsewhere, and the teaching hospitals have become the main regional consultant centres, providing specialist medical care. The effect on the medical schools has varied, being least in the provincial and Scottish teaching hospital groups and in the smaller London hospitals, and greatest in the bigger London hospitals in which specialisation was already advanced in 1948. Everywhere, however, it has become apparent that the educational requirements of the undergraduate teaching hospital are in many ways incompatible with the administrative requirements of a regional consultant centre.

In the first place, the establishment of large diagnostic and therapeutic departments within the teaching hospitals, rather than in associated regional hospitals, has enhanced the distortion of the student's clinical experience, which was already a matter of grave concern. Owing to limitations on new building, the expansion of special departments has often been at the expense of general medical and surgical facilities. Segregation of clinical material has increased, and in many fields the clinical experience of the student has lost in breadth and variety, as it has gained in depth and detail. For the special departments have tended to collect rare and difficult cases as well as a disproportionate number of patients attracted by new techniques in surgical treatment. And so the range of cases suitable for undergraduate instruction has progressively contracted.

The changes in teaching-hospital staffs are no less important. Establishment of a special department almost always means the substitution of two specialists for one general physician or surgeon, and there has therefore been a rapid increase in the number of clinical teachers. This access of numerical strength, though obviously of advantage to patients, weakens the cohesion of the teaching team and further reduces the already tenuous contacts between students and staff. For a number of reasons many consultants spend more time at the teaching hospital than before. The development of operative techniques has made the specialist surgeon more dependent on his hospital team, and where private beds are available, private patients have followed the surgeon to the teaching hospital. There is thus a tendency to the geographically full-time status seen in American hospitals. Yet the terms of appointment under the National Health Service have hardly (if at all) allowed the consultant more time or energy for teaching activities, joint consultant rounds, clinical conferences, or tutorial functions. In fact, for most consultants, teaching responsibilities are combined with ward rounds or outpatient sessions which are undertaken in contract with the Ministry of Health. Furthermore, the heavy burden of taxation and the shrinkage of private practice have led the young consultant in particular to seek additional sessions at regional hospitals. This has reduced still further his opportunities to meet his colleagues and to take part in those corporate activities of teaching and research which made such a vital contribution to medical education.

These changes have in turn influenced the character of clinical teaching. It is true that some of our wisest teachers have been specialists in some branch of medicine or surgery, and every physician and surgeon must nowadays be a specialist to some extent. A good teacher can teach general principles however narrow his clinical interests. Nevertheless, we cannot ignore the influence of excessive specialisation. Patients are increasingly selected and diagnosis increasingly uses instrumental techniques. The student finds it more and more difficult to gain a sense of proportion. Few clinicians in special departments have a clear conception of the curriculum as a whole, and if they are popular teachers they are all the more likely to contribute to the uneven distribution of emphasis for which the teaching hospitals are justly criticised.

Specialisation also damages the apprenticeship system, because the student is given less and less responsibility. Because of their complexity and importance, operative techniques, postoperative dressings and procedures, and special observation and investigation are carried out by registrars or trained nurses, and the student is reduced to the status of an observer with little sense of participation in the care of the patient or the activities of the medical team. Students tend to become passive listeners instead of active learners and to lose the habit of critical discussion and inquiry.

Many will think that this is an exaggerated picture or that these conditions apply in only a few badly regulated medical schools. I am well aware of the great differences in development and organisation of different teaching hospitals, in both London and the provinces, and I agree that what I have described is not a generally established state of affairs. But the trend is universal, and it has been much accelerated by the development of the National Health Service. The requirements of medical education demand that the teaching hospitals should remain in the forefront of medical progress. To do this they must encourage specialisation and provide the facilities for clinical and laboratory research. But a *balance* must be maintained. Some more authoritative organisation than exists at present must be given the responsibility for preventing or correcting the undesirable side-effects on medical education which I have outlined.

Changes in Premedical Education

In the past ten years the field from which medical students have been selected has been considerably widened. Payment of fees and maintenance grants by education authorities has greatly reduced the hardships or stringencies previously imposed by finance. It is probable that these restrictions now operate, if at all, only on the children of those in higher income-groups who may be ineligible for the payment of awards they have won. Although it is now easier for many parents, it is harder for those in the professional classes to send their sons or daughters into medicine.

An excess of applicants over places in medical schools has made selection possible. It is, however, very hard

4. Ministry of Health: The Development of Consultant Services. London, 1950.

to say whether this has improved the quality of medical students. There is in fact no means of comparison. Almost all the factors affecting students have changed, and I personally believe that we have very little accurate information about the students in our schools.

Although selection has been widened in one way, it has been restricted in another. The academic requirements for entry into universities have been raised, and the average student does not complete them until the end of his school career after a two-year course of study. For almost all who wish to take up medicine, this study is limited to subjects of the 1st M.B. examinations; for not to limit it in this way would prejudice the student's chances of passing the 1st M.B., even after a year's course at the university. But studying even two scientific subjects up to advanced level in the General Certificate of Education seriously reduces the opportunities for studying any other subjects. Although the scientific sides of all public schools and grammar schools have been strengthened since the war, it is difficult for these schools to provide classes in which general education can remain balanced and at the same time the examination requirements be satisfied.

Moreover, it is natural for boys and their parents to argue that if two-thirds of the 1st M.B. examination can, and virtually must, be passed from school, then the only sensible course is to complete the 3rd part also, and thus avoid a year at the university devoted to the study of one subject. In consequence it has become common practice for future medical students to devote the last two years of their schooling to chemistry, physics, and biology almost exclusively. Direct entry to the pre-clinical department of the medical school is now common and is increasing. For twenty years it has been the standard procedure at the University of Cambridge, which requires that these parts of the 1st M.B. should be passed before entry.

The importance of a good general education to those who are to be doctors has been stressed repeatedly. Although some have wished to exclude science, the majority regard a good education as a balanced one. The deplorable fact is that medical students now have a less balanced general education than ever before. Many in fact cease to have any non-scientific education at all after the age of 16.

This unrelenting demand for a high examination standard in the premedical sciences has hampered good scientific education. Except in schools with an unusually large science staff, it is almost impossible for the average boy to gain a sound scientific understanding and at the same time acquire the amount of factual knowledge required to take three (in London University until recently four) subjects at advanced level. The premedical examination is, however, an inflexible criterion of selection, and it ensures that, from the age of 16, prospective medical students are conditioned to factual teaching for factual examinations. At each later stage of the curriculum this conditioning process is continued and reinforced.

I am unaware of any figures showing what proportion of candidates selected by medical schools on grounds of character and personality are later refused for failing to pass the 1st M.B. I doubt whether anyone can assess what some of those who pass and enter have forgone in their last two years at school in order to get through—the athletic activities that have been given up, the general reading that has been abandoned, the prefectships that were not taken up or not taken seriously. Positions of responsibility at school are of inestimable value to boys who are destined to have very little responsibility in the later years of their professional training.

Grants and Examinations

The majority of medical students are to some degree State-supported by grants. With these grants and family help some are comparatively well off, while others manage moderately well with part-time paid employment. Others are quite comfortably supported financially by a combination of a grant and a wife who is earning. A comparatively small number, with no grant or only a minor one, exist at subsistence level only. In all cases, however, the financial implications of examination failure are very serious.

Most grant-giving authorities are, in my opinion, very sympathetic to their medical students; but some naturally have difficulty in realising that a degree course in medicine is not comparable with a degree course in, for example, history. There is no honours degree course in medicine: it is a matter of pass or fail in the examinations, and during the past five years the failure-rate in London University's final M.B.—an external examination—was between a third and a half of those making their first attempt. The situation is not much different with the external qualifying examinations of other licensing bodies. Thus for a not inconsiderable proportion of medical students the clinical curriculum is prolonged for six months beyond the accepted course—even if they pass the examination at the second attempt.

To the grant-giving authorities this high failure-rate is both baffling and expensive, and at least one county council has notified students that failure in the examination will be immediately followed by withdrawal of the grant. This situation inflicts a grave injustice on many students, and, apart from the anxiety occasioned, it has further repercussions. For a large proportion of grant-aided students take the Conjoint diploma in addition to the university degree as an insurance against M.B. failure and loss of grant. This procedure not only adds to the financial strain but also interferes seriously with the third year of clinical training; for the idea that students take these extra examinations merely for practice, without specific preparation and without undue concern, is, in my experience, largely a myth. There is no more lamentable facet of medical education in this country than the double external qualifying examination.

The Student's View

With this atmosphere of learning in mind, it is worth trying to envisage the medical curriculum as it may appear to an average student.

He comes to his medical school armed with whatever general education he had acquired on reaching the age of 16—to which he has added remarkably little since, either from learning or from experience of the world. He has spent up to three years on the study of chemistry, physics, and biology. He then spends about two years on isolated study of anatomy, physiology, biochemistry, and (if he has to pass an examination in it) pharmacology. He often gains no knowledge of psychology except that given him by his own experience and his inherited intuition.

When he comes to clinical studies, he rarely has any knowledge of pathology; he has seldom acquired the art of learning (being accustomed to the acquisition of knowledge by memorising, and relying mainly on didactic lectures and textbooks); and his critical faculty has seldom been awakened. He is enormously relieved that he has no further important examinations to face for nearly three years, and he is prepared to take things more easily. Nevertheless he starts his clinical work with enthusiasm. This, he thinks, is the real thing: he is going to deal with people, and he usually believes that work will now be much more stimulating and much less difficult. The stimulation of the live patient lasts for some time; but medicine soon begins to appear extremely vague and muddling, and often most disappointing. There seems to be no sure basis for it all. Pathology, which might give him this, seems to him (if indeed he meets it at all in the early months) a very strange subject with a terminology that he does not

understand, but yet bearing an unpleasant similarity to those preclinical subjects which he found hard and dry.

So he spends little time methodically obtaining a basis of pathology, and in fact he learns very little for himself. Never having done so before, he hardly knows how to begin; and in any event he finds that he is given a large amount of teaching. Unfortunately the teachers, unlike those he has previously experienced, seem to teach at random—their subjects being in fact dependent on the ever-changing nature of the patients under their care—and, what is worse, teachers now conflict with each other. Medicine seems to be most confusing, and it would be pleasant indeed to escape by busying himself in doing something (however small) for the patients themselves.

Unhappily there is little he can do, and although he must learn about clinical investigations in the abstract he is but rarely considered competent to collect the specimens on which the tests are made, let alone make the tests. Thus he finds himself with almost no apparent responsibility to the patients still described as his; and, relegated to the rôle of observer, he wanders rather disconsolately from department to department, trying to remember as much as possible of the specialised knowledge poured out to him in each by his many teachers. And perhaps he takes the opportunity to see something of life, which he has been too busy to do since he was 16. Now at 21 he plays games again and does those things which many of his non-medical friends have already got tired of doing. Thus he continues, losing heart in medicine from which he drifts further away. A course of pathology may help, and then midwifery brings a most welcome change. At last he seems to be a part of the medical profession—at last he has something to do. He enjoys midwifery. Then quite suddenly he finds that his final examinations are now within measurable distance. His existence is threatened. His financial support may cease if his examinations are not passed. He remembers the very many learned discourses which have gone over his head since he began his clinical studies. Somehow he must now master this vast mass of knowledge, for that surely is medicine.

Appalled at his believed ignorance, and at the size of the task ahead, he cuts himself off from normal life, eschews all that remains of his curriculum which is not obviously or by repute directed towards the passing of his examinations, and struggles to learn what he now thinks is medicine—from books, and from those very "factual" teachers who are happy to give him lists of causes, lists of symptoms and signs, and descriptions of treatments which can be quickly memorised. Somehow or other he manages to pass, sooner or later, an examination which is primarily a test of knowledge but almost never a test of training.

Through this standardised curriculum the student often passes without guidance—one of a group, unknown as an individual. He is subjected to "group" training throughout, and his experience and learning are both affected by the "personality" that his particular group takes on. There are mature and immature, active and passive, interested and uninterested groups.

Fewer and fewer opportunities exist for him to choose some aspect of medicine for more particular study or to carry out some elementary scientific inquiry. As in a factory, he is placed on a belt, and this inexorably carries him through three years of production. He is mass-produced, and the end-product is neither the practical doctor, capable of dealing with common problems, nor the young man who has learnt how to learn and has become capable of applying clear thought to clinical findings. Too often it is a somewhat immature young man, with a considerable knowledge of uncoordinated details and a weak understanding of principles; with an insecure foundation in clinical method and small ability for scientific appraisal; ill-prepared for the responsibilities to come, of which he has been made little aware.

This factory differs fundamentally from others in that at each stage of the process, in each department, what is done to the product matters much less than what the product does. Teaching is far less important than learning.

The dean's office keeps the production-line moving; the teachers teach (year in year out, without pause for respite, reflection, or assessment of results); but the incentive to learning comes mainly from fear of examinations, and the learning is directed to the accumulation of factual data with which to pass them. This fear is greater than it has ever been before, and so is the body of factual knowledge.

Again, many may think that I have exaggerated. Obviously the picture varies from school to school, but I submit that the trend is in the same direction everywhere—and the direction leads away from the patient. It is only too easy to be unaware of this; for as teachers our period of observation of the individual student is limited, and it gets smaller as the number of teachers increases. Our assessment of the results of education is made, for the most part, on house-officers, usually selected because they were regarded as the best students. Moreover, it is made during a period of rapid maturation, when enthusiasm is replacing boredom, and the mental infarction of five years is being recanalised.

Attempts at Reform

Having reviewed the major environmental changes which in recent years have reacted, usually unfavourably, on the practice of medical teaching, I turn now to the remedial aspects. What has been done to correct these secondary deviations? Many excellent recommendations were made in the various reports. The most far-reaching were those of the 1944 committee of the Royal College of Physicians and of the Goodenough Committee, and some of these found expression in the Recommendations of the General Medical Council in 1947 and in the Medical Act of 1950 on preliminary-registration house-appointments. The General Medical Council was mainly concerned with correcting a number of deficiencies in the clinical curriculum. Thus it recommended that certain special subjects such as social medicine, pædiatrics, and psychological medicine should be given greater emphasis and teaching time. But it was also concerned at the intellectual gap between preclinical and clinical studies and recommended the addition of a three-month introductory course transitional between these two phases of training. The majority of medical schools have tried to fulfil most of these demands, and the increase in number and strength of the whole-time clinical units, advocated in the college report, has been an undoubted factor in doing so.

The introductory course has, I believe, done much to secure smoother transition between the systematic disciplines of anatomy and physiology and the unsystematic teaching of clinical medicine. It has been the more effective where preclinical and clinical teachers have previously joined forces in clinical demonstrations to illustrate the applications of anatomy and physiology. Nor can one be critical of the greater emphasis which has been placed on social and psychological medicine, for the doctor is increasingly faced with practical problems in these fields. Yet the regrettable outcome of these changes has undoubtedly been to increase the already unreasonable load of instruction with which the student is faced during his clinical years. What is more, the burden has in some schools been increased by special examinations in pædiatrics and psychological medicine.

The other major reform, and one of very great educational potentialities, is the institution of the preliminary-registration year of hospital appointments under supervision. This year is now an officially recognised part of the undergraduate curriculum. During the three years of its operation, however, no serious attempt has been made to integrate the special experience of this period with the rest of medical training. In effect, the qualifying examination forms a barrier to educational continuity at *this* stage just as effective and as harmful as that which the 2nd M.B. interposes between clinical and preclinical teaching. It must be remembered that, although the universities have the responsibility for approving these posts and for certifying that the student carries out his preliminary-registration training satisfactorily, it is the hospital authorities that make the appointments and pay the salaries. Between the two there is at present no adequate liaison, and in making the appointments and deciding the character of clinical experience which they provide, the needs of hospitals for "pairs of hands" play a far greater part than any educational considerations.

In short, the primary reforms which have been made in the past ten years, in face of rapidly changing conditions, have been well conceived and were potentially effective, but they have not brought any appreciable relief because the system itself is outworn. In the apt words of Prof. Clifford Wilson: "The old tree creaked before; its branches were overgrown and its roots insecure. It needed drastic pruning and the fertilisation of new enthusiasms and ideas. Instead it was given a number of grafts and they have not taken very well."

Medical Education in America

It was against this background that I visited last year a number of American medical schools; and from what I saw I should like to single out some features which seem particularly relevant to our present situation. Although the growth of medical education has been much more rapid and diversified in the United States than it has here, we have much in common in our aims and methods of thought—largely because of the constant interchange of ideas between our two countries.

In the first place I was impressed by the intense awareness of the problem of medical education. In the individual schools both staff and students are actively interested in its improvement, and the great foundations are stimulating and supporting research into educational methods.

As far back as 1924, a situation in many respects comparable to our own of today led the Association of American Medical Colleges to establish a national Council on Medical Education. Serious problems had arisen through the combined effects of rigid controls and excessive specialisation. At its first meeting the council decided that the immediate need was "to secure relief, if possible, from the restraint and burden of external regulations."[5] It is no doubt this early conviction which is responsible for the striking differences which now exist between the American medical schools and our own in the opportunities and freedom to experiment. Not only have there been radical and novel experiments in certain centres, but even the older and more conservative schools have been able to make big changes when the need arose. One of these has been the virtual abolition of the final examinations at the end of the clinical course. Educational continuity is thus encouraged, and is further supported by the considerable efforts at integration in the earlier stages. Throughout, joint teaching sessions and conferences are far more numerous than in this country.

A most important factor is the proportion of his time and energy which the clinician spends in hospital. In the U.S.A. the "geographical full-time appointment" has been deliberately encouraged and is now common in the main teaching centres. Thus clinical conferences, combined rounds, and group discussions offer far greater opportunities than we enjoy for the exchange of ideas and information. No less important is the much closer personal contact between student and teacher. The student is taught as an individual rather than as a member of a heterogeneous group, and individual assessment of progress is made periodically before he proceeds to the next stage. He is, of course, older than his counterpart in this country having had a longer premedical education, and he has at least that added maturity which develops so rapidly at this period. This partly accounts for the fact that he works much harder than the English medical student, shows far more interest, and is more critical in his approach. He is given time for special study of his own choosing and often undertakes minor researches. Examinations play a very small part in his incentives, which seem to derive mainly from a genuine and active interest in his work.

Experiments in medical education are difficult to assess and easy to criticise. Whatever they do or do not achieve, they bestow an undoubted benefaction on a medical school in the enthusiasm and sense of joint endeavour they produce in both students and staff. A study of medical education in the United States at the present time can be most rewarding. It helps us to recognise more clearly what we must do to retain and strengthen what is good, and to eradicate what is bad, in our own system.

(To be concluded)

5. Commission on Medical Education, final report of 1932. New York.

PARITY AND THE INCIDENCE OF DIABETES

D. A. PYKE
M.B. Camb., M.R.C.P.
SENIOR MEDICAL REGISTRAR,
RADCLIFFE INFIRMARY, OXFORD

IT is a common observation that more women than men have diabetes mellitus. In youth there is little difference in sex-incidence, but after about the age of 45 a preponderance of women appears, and from that age onwards women outnumber men by at least three to two (Harris 1949, Joslin et al. 1952). Various reasons have been suggested for this difference, in particular that it may be because more women than men are fat, and that it may be related to the menopause (Joslin et al. 1952, Bartels 1953).

I report here a survey of the patients attending the diabetic clinic at the Radcliffe Infirmary in relation to

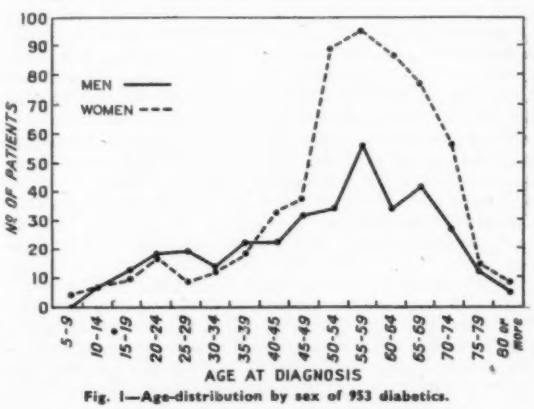


Fig. 1—Age-distribution by sex of 953 diabetics.

TABLE I—SEX-DISTRIBUTION AMONG GENERAL POPULATION

Age (yr.)	No. of men in group	Preponderance of women in general population	Expected no. of women
45–49	34	0	34
50–59	95	10%	104
60–69	78	31%	102
70 or more	44	49%	66
Total	251	..	306

the effect of parity and of weight on the incidence of diabetes. The study comprised 1134 patients, of whom 181 were excluded because of inadequate data regarding height or weight at the time of diagnosis. Many of the excluded patients had originally attended other clinics, and it was impossible to obtain the necessary information about them. Of the remaining 953 patients 583 were women and 370 were men. Their ages at diagnosis are shown in fig. 1. A preponderance of women is seen among those in whom diabetes is diagnosed in middle and late life.

TABLE II—PARITY OF NORMAL WOMEN (MARRIED AND UNMARRIED) AGED 45–49 (1% SAMPLE OF 1951 CENSUS)

Parity	Percentage	Parity	Percentage
0	32·6	4	5·9
1	21·8	5	3·0
2	20·6	6	2·0
3	11·2	7 or more	2·9

If a division is made at the age of 45, there are 106 women and 119 men under this age but 477 women and 251 men over this age. An attempt has been made to account for the preponderance of women among the older patients.

Sex-distribution among the General Population

Part of the difference is due to the fact that there are more middle-aged and elderly women than men in the general population. In the age-group 40–49 the sexes are equally numerous, in that of 50–59 there are 10% more women, in that of 60–69 31% more women, and over the age of 70 there are 49% more women. These figures indicate that some excess of women would be expected apart from any factor operating selectively (table I). Part of the sex difference in older diabetics is due to the excess of women in the general population at this age.

TABLE III—EXPECTED NUMBER OF WOMEN IN EACH PARITY GROUP

Parity	No. of women expected	Parity	No. of women expected
0	100	4	18
1	67	5	9
2	63	6	6
3	34	7 or more	9
		Total	306

Parity

Figures for the parity of normal women aged 45–49 in England and Wales may be obtained from the 1% sample of the 1951 Census * and are shown in table II.

If the 306 women, who would be expected to correspond to the 251 men aged more than 45 among the present group of diabetics, are divided in these proportions, the figures shown in table III are obtained.

* Figures are not given for the parity of women aged more than 49. It must therefore be assumed that the parity of women aged more than 49 in 1951 was not significantly different from that of those then aged 45–49.

The numbers in each parity group among the diabetic women are given in table IV.

If the observed figures are compared with those theoretically expected (table V), it is found that the excess of diabetic women is confined to those who have borne children, the number of nulliparæ (91) being about that expected (100). The relative excess of women increases with each degree of parity. A woman with five children has about three times as much chance of developing diabetes as a woman with none. This is represented in fig. 2.

It thus appears that parity and the normal difference in sex-distribution among the general population together account for all the excess of women observed in diabetics.

TABLE IV—PARITY OF 477 WOMEN IN WHOM DIABETES WAS DIAGNOSED OVER THE AGE OF 45 (ONLY LIVE BIRTHS ARE INCLUDED)

Parity	No. of women	Percentage
0	91	19·6
1	69	15
2	89	19·3
3	58	12·5
4	44	9·5
5	27	5·8
6	25	5·4
7 or more	60	12·9
Not recorded	14	
Total	477	

TABLE V—COMPARISON OF OBSERVED AND EXPECTED NUMBER OF WOMEN IN EACH PARITY GROUP

Parity	Theoretical no. expected	Observed number	Observed/expected (%)
0	100	91	91
1	67	69	103
2	63	89	141*
3	34	58	171†
4	18	44	244†
5	9	27	300†
6	6	25	417†
7 or more	9	60	667†
Total	306	463	..

* $P(\chi^2) < 0.01$, n = 1. † $P(\chi^2) < 0.001$, n = 1.

Parity and Age at Diagnosis

Parity does not lead to the appearance of diabetes earlier in life. Table VI shows the average age at diagnosis for women aged more than 45. The age at diagnosis is similar for all degrees of parity.

TABLE VI—AGE AT DIAGNOSIS OF WOMEN OVER 45 IN RELATION TO PARITY

Parity	No. of women	Average age at diagnosis (yr.)
0	91	60·4
1	69	59·0
2	89	60·4
3	58	60·6
4	44	60·7
5	27	59·0
6	25	63·7
7 or more	60	63·3

Weight

That the effect of parity on the incidence of diabetes is not merely a reflection of a greater incidence of obesity among multiparæ is suggested by table VII, which shows that about 31% of the nulliparæ are overweight.†

† Overweight is here defined as 10% or more above, and underweight as 10% or more below, the average weight for height and age given by the Association of Life Insurance Directors and Actuarial Society of America in 1912 and cited by Duncan (1952).

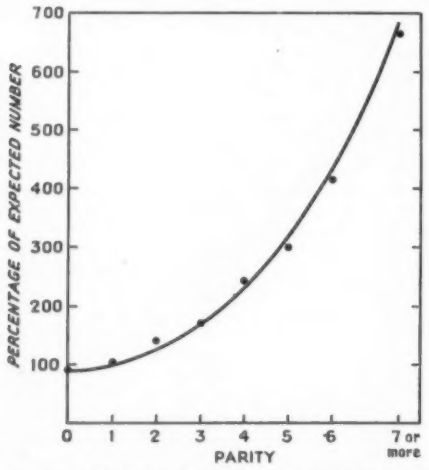


Fig. 2—Increase of incidence of diabetes with parity in women aged 45 or more.

This figure increases to nearly 50% for women who have borne two children but thereafter remains roughly the same for the higher parity groups. The difference between the nulliparous and highly parous women expressed in this way is much less than the difference between their relative incidence of diabetes.

Furthermore, as shown in fig. 3, the relative increase of women diabetics with age is as pronounced among the normal and underweight as among the overweight.

Discussion

That the sex difference in the incidence in diabetes is confined to married patients was observed over twenty years ago by Mosenthal and Bolduan (1933), who attributed it in part to "the injurious effect of pregnancy upon the carbohydrate tolerance." Joslin et al. (1936) confirmed this observation and attributed the difference mainly to a greater tendency of married women than single to become fat. They thought that the increased

TABLE VII—INCIDENCE OF OVERWEIGHT IN RELATION TO PARITY

Parity	No. of women	Percentage overweight
0	91	31
1	69	36
2	89	46
3	58	53
4	44	46
5	27	58
6	25	61
7 or more	60	41

incidence of diabetes among middle-aged women "reflects the strain on the endocrine system during menopause."

Munro et al. (1949) found that the large excess of women over men among their patients aged more than 40 (719 women, 239 men) was confined to married women, and that the difference could be "related, at least in part, to previous childbearing," because they found more mothers of large families among their patients than were expected. These workers thought that marriage and childbearing did not affect the age of onset of diabetes or its severity, judged by tendency to ketonuria.

The present study suggests that the effects of parity are alone enough to account for all the true difference in the sex-incidence of diabetes. This finding is in harmony with the views of Hoet (1954) and Jackson (1955), who regard pregnancy as an important provoking factor in a patient who is potentially diabetic. It is curious, if this is true, that pregnancy should lead to the development of diabetes, or rather its diagnosis, only some decades later, and that parity does not lead to the earlier appearance of diabetes. Nor does parity explain the apparent increase of diabetes among women in this century (Harris and McArthur 1952).

The greater tendency of multiparous than nulliparous women to become fat does not appear alone to be enough to explain the large number of multiparæ, because (1) there is a preponderance of women diabetics aged more than 45 even among those of normal weight and those underweight, and (2) the number of multiparæ who are overweight, though greater than the number of nulliparæ who are overweight, does not appear to be enough to explain the large difference in the incidence of diabetes among multiparæ and nulliparæ. Figures for weights of normal women also show a relatively small increase with parity (O'Brien and Shelton 1941).

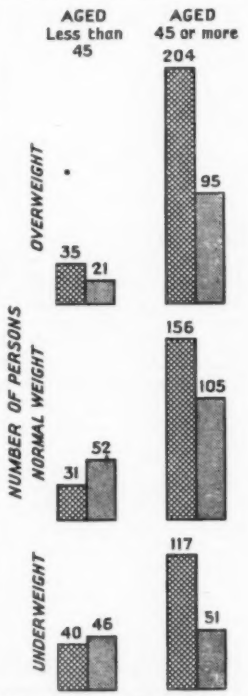


Fig. 3—Sex-incidence of diabetes in relation to age and build. In patients aged 45 or more there is a preponderance of women (*hatched*) over men (*stippled*) among the normal and underweight as well as among the overweight.

That the menopause is not an ætiological factor of importance is suggested by the fact that there are no more nulliparæ aged more than 45 among the diabetics than are to be expected among the general population. If the menopause were a significant factor, an excess of women would be found in all parity groups, including the nulliparæ.

Summary

An analysis of 953 diabetics shows an approximately equal sex-incidence under the age of 45 but a preponderance of women over 45.

Part of this difference is due to the excess of women in the general population. The rest of the difference can be explained by the effect of parity. The excess of women diabetics is confined to women who have borne children, and rises with increasing parity. A woman who has had five children appears to have about three times as great a chance of developing diabetes as a woman who has had none; but parity does not lead to the earlier appearance of diabetes.

This effect of parity cannot be due merely to a slightly greater tendency of multiparæ to become fat, since the preponderance of women diabetics is found among those who are of normal weight and those underweight.

Likewise, if the menopause were an ætiological factor of importance, an excess of women diabetics would be expected in all parity groups, but this is not the case.

I wish to thank Dr. A. M. Cooke for help and advice, Miss B. Merry and Mrs. M. Eastway for hours of laborious clerical work, Mr. J. H. Luck, records officer of the Oxford Regional Hospital Board, for analysis of clinical data, and Mr. A. Barr for statistical advice.

References at foot of next column

BED REST IN THE TREATMENT OF PULMONARY TUBERCULOSIS

W. F. TYRRELL
B.Sc., M.B. Glasg., D.P.H.
CHEST PHYSICIAN, RUCHILL HOSPITAL, GLASGOW

IN 1926 Stocks and Karn claimed to show statistically that patients with pulmonary tuberculosis who were treated in sanatoria fared no better than those who were not, and the controversy arising from this work has continued spasmodically with no clear-cut result. Most workers in pulmonary tuberculosis know of patients who have overcome their disease without entering a sanatorium. This raises the question whether their disease would have been more quickly or more certainly arrested if they had followed the conventional path. In other words: Is rest in bed really necessary for most patients with pulmonary tuberculosis? I describe here the preliminary results of an attempt to answer this question.

Material and Method

In May, 1954, it was possible to admit to sanatoria only some of the patients with pulmonary tuberculosis in Glasgow, and the remainder were of necessity treated as outpatients. From a public-health viewpoint this situation was clearly unfortunate, but it did offer an opportunity of assessing the therapeutic value of bed rest. It was accordingly decided to admit to hospital every alternate new patient in the Northern area of the city and to treat the others as ambulant outpatients. The criteria for acceptance into the trial were that the patient (1) had active pulmonary tuberculosis, (2) was aged 14–54, (3) was not living in lodgings, and (4) was ambulant when first seen. Those allocated to inpatient treatment were admitted to the sanatorium within two weeks of diagnosis and were kept on strict rest in bed.

TABLE I—AGE-DISTRIBUTION OF INPATIENTS AND OUTPATIENTS, BY SEX

Group	Age (yr.)				Av. age (yr.)
	14–24	25–34	35–44	45–54	
Males:					
Inpatients ..	14	11	5	4	29·5
Outpatients ..	12	11	7	3	30
Females:					
Inpatients ..	24	8	4	2	24·6
Outpatients ..	17	12	7	1	27·5

The outpatients in the trial were encouraged to remain up and about; and all except 5, who were treated similarly by their own doctors, reported to the hospital for injections of streptomycin. Apart from the amount of exercise allowed, the inpatient and outpatient groups had identical investigation and treatment.

Altogether 141 patients have completed three months' treatment, and 94 of these have completed six months' treatment. In these 94 cases the chemotherapy consisted of streptomycin 1 g. and isoniazid 400 mg. on the same day twice weekly; and the remaining 47 patients, who have so far completed only three months' treatment, received the same chemotherapy on five days each week. 1 male outpatient and 1 male inpatient had to be withdrawn from the trial before three months' treatment was completed because of drug sensitivity and tuberculous empyema respectively; 3 females in the six-month treatment group left hospital between the three and six month periods.

Table I shows that the inpatient and the outpatient groups were closely matched in age-distribution.

Results

Erythrocyte-sedimentation Rate

Table II shows the number of patients in each group who had an erythrocyte-sedimentation rate (E.S.R.) greater than 10 mm. in the first hour (Westergren) at the three periods of assessment.

TABLE II—E.S.R. LEVELS

Group	No. completed 3 months' treatment			No. completed 6 months' treatment		
	Total	E.S.R. > 10 mm.		Total	E.S.R. > 10 mm.	
		At start	At 3 mos.		At start	At 6 mos.
Males:						
Inpatients ..	34	23	10	23	17	3
Outpatients ..	33	27	8	22	20	4
Females:						
Inpatients ..	37	27	15 +2 preg.	22	15	6 +1 preg.
Outpatients ..	37	28	14	24	21	8 +2 preg.

Of the 25 female inpatients in the six-month treatment group (including 1 who was pregnant), 3 left hospital irregularly between three and six months, so the numbers of patients who actually completed six months' treatment in the various groups are:

Males: inpatients 23, outpatients 22
Females: inpatients 22, outpatients 24

Table II shows that 2 of the inpatients at the three-month stage and 1 at the six-month stage were pregnant; and 2 of the outpatients were pregnant at the six-month stage. All 5 had an E.S.R. greater than 10 mm., but are not included in the main figures as their pregnancies may have been the cause of the raised E.S.R. Table II shows no significant difference between the groups in regard to E.S.R. response to treatment. That the two groups were well matched in initial severity of illness is also shown by the fact that 35 of the inpatients and 31 of the outpatients had an E.S.R. of 30 mm. or more at the outset.

Body-weight

At the start of treatment, both the male and female inpatients were on the average slightly lighter than the outpatients (table III). At three months the male inpatients and outpatients had gained approximately the same weight, whereas the female inpatients showed an appreciably greater gain than the female outpatients. At six months both male and female inpatients had gained a further appreciable amount of weight, whereas on the average the male and female outpatients had lost

TABLE III—AVERAGE BODY-WEIGHTS

Group	Average weight (lb.) at start	Average gain (lb.)	
		At 3 mos.	At 6 mos.
Males:			
Inpatients	127	9	15·5
Outpatients	132·5	8	5·9
Females:			
Inpatients	109·2	14·5	21·1
Outpatients	113·4	6·6	5·2

DR. PYKE: REFERENCES

Bartels, E. D. (1953) *In* Sorsby, A. Clinical Genetics. London.
Duncan, G. G. (1952) Diseases of Metabolism. London.
Harris, H. (1949) *Proc. R. Soc. Med.* **42**, 326.
— McArthur, N. (1952) *Ann. Eugen., Lond.* **16**, 109.
Hoet, J. P. (1954) *Diabetes*, **3**, 1.
Jackson, W. P. U. (1955) *Lancet*, ii, 625.
Joslin, E. P., Dublin, L. I., Marks, H. H. (1936) *Amer. J. med. Sci.* **191**, 759.
— Root, H. F., White, P., Marble, A. (1952) The Treatment of Diabetes Mellitus. 9th ed., London.
Mosenthal, H. O., Bolduan, C. (1933) *Amer. J. med. Sci.* **186**, 605.
Munro, H. N., Eaton, J. C., Glen, A. (1949) *J. clin. Endocrin.* **9**, 48.
O'Brien, R., Shelton, W. C. (1941) United States Department of Agriculture, Miscellaneous Publications no. 454.

TABLE IV—RESULTS OF EXAMINATION FOR TUBERCLE BACILLI

Group	At start		At 3 mos.		At 6 mos.	
	Total patients	No. +ve	Total patients	No. +ve	Total patients	No. +ve
Males :						
Inpatients ..	34	29	34	9	23	6
Outpatients	33	30	33	9	22	4
Females :						
Inpatients ..	37	33	37	9	22	4
Outpatients	37	33	37	10	24	5

respectively 2·1 and 1·4 lb. of the weight they had gained at three months. It is worth noting that 18 of the 37 female outpatients were married and the majority continued to run their households throughout treatment; whereas 28 of the 33 male outpatients, although ambulant, remained off work for at least the first three months.

Bacteriology

Each patient was asked to submit specimens of morning sputum on three consecutive days immediately before the start of treatment and at three-monthly and six-monthly intervals. These specimens were examined for tubercle bacilli by direct microscopy. Bronchial lavage (Lees et al. 1955) was also performed at these times and the specimens obtained were examined by direct microscopy and cultured. The results are shown in table IV.

A positive result signifies the finding of the tubercle bacillus by either sputum or bronchial-lavage examination or both. Some patients were unable to submit enough sputum for adequate examination, but a satisfactory specimen was always obtained by bronchial lavage. The inpatient and outpatient groups were well matched as to bacteriological status at the start of treatment, and the proportions in the two groups showing sputum conversion at three months and at six months were almost exactly the same.

TABLE V—ZONES OF LUNG INVOLVED RADIOGRAPHICALLY AT START OF TREATMENT

Group	Number of lung zones involved						Total patients
	1	2	3	4	5	6	
Inpatients ..	13	28	18	12	..	..	71
Outpatients ..	11	14	26	15	3	1	70

TABLE VI—ZONES OF LUNG CLEARED AFTER THREE MONTHS' AND AFTER SIX MONTHS' TREATMENT

Group	After 3 mos.		After 6 mos.	
	Total patients	Zones cleared	Total patients	Zones cleared
Inpatients ..	71	20	45	22
Outpatients ..	70	25	46	27

Radiography

The radiographic appearances were assessed by a radiologist who was unaware to which group the patients belonged. Table V shows an analysis of both groups of patients according to the number of lung zones involved. It will be seen that in many cases the lungs were widely affected and that the outpatients, as a group, had more extensive disease. Table VI gives the number of lung zones which cleared in each group of patients after three months and after six months. If anything, more zones had cleared in the outpatients than in the inpatients; but the outpatients, as a group, had more zones involved initially.

TABLE VII—CAVITY CLOSURE AFTER THREE MONTHS' TREATMENT

Group	Total no. of patients	No. with cavitation at start	No. with cavity closure at 3 mos.
Inpatients	71	43	13
Outpatients	70	44	12

Cavitation

In assessing the position as regards cavitation, all cavities were measured at the start and again at three months and six months. Table VII shows the number of patients with measurable cavitation at the start and after three months' treatment; small, multiple cavities are not included.

43 of 71 inpatients and 44 of 70 outpatients had measurable cavities at the start of treatment, and after three months cavity closure had taken place in 13 inpatients and 12 outpatients.

TABLE VIII—CAVITY CLOSURE AFTER SIX MONTHS' TREATMENT

Group	Total no. of patients completing 6 mos. treatment	No. with cavitation at start	No. with cavity closure at 6 mos.
Inpatients ..	45	31	20 (*64·5%*)
Outpatients ..	46	33	15 (*45·4%*)

Table VIII shows the number of patients who, having completed six months' treatment, showed cavity closure.

At the start 31 of 45 inpatients and 33 of 46 outpatients had cavitation, and after six months' treatment 20 (64·5%) of the inpatients and 15 (45·4%) of the outpatients showed cavity closure.

The cavity position in the patients who completed six months' treatment is further analysed in table IX.

TABLE IX—CLOSURE OF INDIVIDUAL CAVITIES AFTER SIX MONTHS' TREATMENT

Group	Total no. of patients	No. of cavities at start			No. of cavities closed at 6 mos.
		Total	<2 cm.	> 2 cm.	
Inpatients ..	45	36	17	19	26 (*72·2%*)
Outpatients ..	46	44	23	21	26 (*59·0%*)

TABLE X—OVER-ALL RADIOGRAPHIC ASSESSMENT

Group	Deterioration	No significant change	Improvement			Total patients
			Slight	Moderate	Excellent	
At 3 months :						
Inpatients	1	4	8	26	32	71
Outpatients	1	2	11	24	32	70
At 6 months :						
Inpatients	2	4	2	18	19	45
Outpatients	2	5	6	10	23	46

This shows that the 45 inpatients had 36 cavities (17 of 2 cm. or less in diameter, and 19 greater than 2 cm.), whereas the 46 outpatients had 44 cavities (23 of 2 cm. or less in diameter and 21 greater than 2 cm.). After six months' treatment 26 (72·2%) of the inpatients' cavities had closed, compared with 26 (59%) of the outpatients' cavities.

Over-all Assessment of Radiographic Changes

The radiographic appearances at three months and at six months were assessed in the categories of (*a*) deteriora-

tion, (*b*) no significant change, or (*c*) improvement (slight, moderate, or excellent); the films taken at six months were compared with those taken at three months. The results are shown in table X, which reveals no essential difference between response of the two groups to treatment.

Discussion

In this investigation the same chemotherapy was applied to a group of patients on strict bed rest in hospital and to a similar group of ambulant outpatients. The principal aspect under consideration was the effect of exercise; but some of the outpatients had domestic conditions of a type which have always been regarded as adverse in the treatment of tuberculosis—including bad housing conditions, domestic disharmony, and financial difficulties—and most of this group were treated under circumstances far from ideal. Since outpatient treatment is being employed on a large scale in this country, it is important to determine whether it increases propagation of the disease. The household contacts of both groups of patients are, therefore, being closely supervised, to ascertain the subsequent incidence of infection.

Despite the adverse environmental factors in the outpatient group, examination of the position after three months' treatment showed no significant difference between the response of the two groups assessed by fall in E.S.R., sputum conversion, extent of clearance of lung disease, and cavity closure. It is true that the inpatients as a group gained more weight than the outpatients; but this must surely be regarded as reflecting physical inactivity rather than regression of disease, because, as is generally agreed, weight gained by patients in a sanatorium is usually rapidly lost when they resume outside activities.

A few patients in both groups have been assessed after completion of six months' treatment. Here again there is little difference in the general response; but cavity closure was commoner in the inpatients. It would, of course, be unwise to reach any firm conclusion before greater numbers are compared, but it would not be surprising if further experience confirmed this trend. Apart from any question of toxæmia or activity of the disease process, there is possibly a mechanical factor in cavity closure which is exploited in many centres by, for example, reversed postural drainage.

It is highly probable that enough hospital beds for all newly diagnosed cases of pulmonary tuberculosis will soon be available, and then immediate admission to hospital in the first instance should be the standard procedure. Before abandoning bed rest in the treatment of pulmonary tuberculosis it would be necessary to study the long-term results in a larger number of patients; but it would seem that, if the results in this preliminary study are confirmed, patients who have ceased to excrete tubercle bacilli might be allowed to resume their everyday occupations much earlier than is now generally thought desirable. In addition, patients with pulmonary tuberculosis might be allowed much greater physical freedom than at present with resultant lessening of the burden on nursing staff and diminished tedium for the patients. Where domestic conditions are suitable, home treatment could confidently be carried out on an even larger scale than at present; and this form of treatment would undoubtedly be preferred by many patients.

Summary

The value of rest in the treatment of pulmonary tuberculosis has been assessed in 141 newly diagnosed cases. Alternate patients were admitted to hospital within two weeks of diagnosis, and treated as ambulant outpatients. Both groups received the same chemotherapy and were assessed in a standard way.

After three months' treatment progress, assessed by reduction of E.S.R., sputum conversion, cavity closure, and over-all radiographic improvement, was as good in 70 ambulant outpatients as in 71 patients on strict bed rest in hospital.

After six months' treatment no difference was found between 45 patients on strict bed rest in hospital and 46 ambulant outpatients as regards reduction of E.S.R., sputum conversion, and over-all radiographic improvement; but cavity closure was commoner in the patients on strict bed rest than in the ambulant outpatients.

I should like to thank Dr. A. W. Lees, consultant chest physician, Ruchill Hospital, for his constant interest in this investigation, and Dr. Agnes Macgregor for her painstaking assessment of the radiographs.

REFERENCES

Lees, A. W., Miller, T. J. R., Roberts, G. B. S. (1955) *Lancet*, ii, 800.
Stocks, P., Karn, M. N. (1926) *Ann. Eugen., Lond.* i, 407.

A CALCIUM-INFUSION TEST

I. URINARY EXCRETION DATA FOR RECOGNITION OF OSTEOMALACIA

B E. C. NORDIN
M.D. Lond., M.R.C.P.
MEDICAL REGISTRAR, HAMMERSMITH HOSPITAL, LONDON

RUSSELL FRASER
M.D. N.Z., F.R.C.P.
READER IN MEDICINE,
POSTGRADUATE MEDICAL SCHOOL OF LONDON

THE use of calcium infusions in the diagnosis of metabolic bone disease was first suggested by Schilling and Laszlo (1951), who argued that the amount of calcium appearing in the urine after a standard infusion should be inversely related to the "avidity" of the skeleton for calcium, and that this urinary excretion should consequently be slight in osteomalacia (where the skeleton is inadequately calcified) and copious in osteoporosis (where the protein matrix is deficient). They gave some preliminary results obtained with four-hour infusions of calcium 450 mg. which appeared to support their thesis.

Numerous workers have published data on various aspects of calcium infusions (McCance and Widdowson 1939, Baylor et al. 1950, Howard et al. 1953, Goldman and Bassett 1954, Kyle et al. 1954, Schaaf and Kyle 1954, Spencer et al. 1954,) but no satisfactory procedure has yet been evolved for the diagnosis of metabolic bone disease. We report here a standard procedure which we have applied to patients in whom there was no reason to suspect bone disease and in more than 100 cases of known or suspected bone disorder; we believe it to be of diagnostic value in suspected osteomalacia.

Procedure

All the subjects of the experiments reported here were given a low-calcium diet (100–150 mg. of calcium and 500–700 mg. of phosphorus daily) for three days before and throughout the test. Their urine was collected from 6 A.M. on the third day to 6 A.M. on the fourth day, and then four-hourly until 6 A.M. on the fifth day. An infusion of calcium gluconate (15 mg. of calcium per kg. of body-weight) was given in 500 ml. of physiological saline solution from 10 A.M. to 2 P.M. on the fourth day. Samples of blood were taken at the beginning and end of the infusion and at 6 P.M. and 10 A.M. next day.

The methods used for the estimation of calcium, phosphate, and creatinine have been reported elsewhere (Nordin and Fraser 1954). The net output of calcium after the infusion is expressed as a percentage of the administered dose after deduction of a basal excretion figure calculated from the previous twenty-four hours' urinary output of calcium. For the interpretation of the urinary excretion of calcium it suffices to measure the

basal excretion on the previous day and the 0–12-hour excretion on the test day.

Patients Studied

The present results were obtained in the first 98 people tested (excluding vitamin-D-resistant osteomalacia)—i.e., 21 patients in whom there was no reason to suspect metabolic bone disease, 12 patients with definite osteomalacia and steatorrhœa, 17 patients with steatorrhœa but no clear evidence of osteomalacia, 18 patients with osteoporosis, and 30 patients with miscellaneous conditions in which bone disease might be suspected. They were aged 14–67 and were either convalescent from an acute illness—e.g., cardiac infarction, peptic ulcer, acute nephritis, colitis, pneumonia, cerebral thrombosis—or had syringomyelia, early rheumatoid arthritis, hypertension, eczema, backache, or very early ankylosing spondylitis.

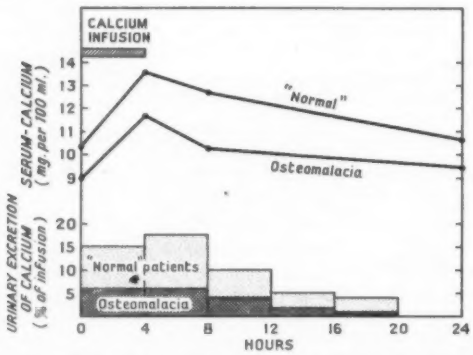


Fig. 1—Changes during test: upper diagram shows mean serum-calcium level during and after calcium infusion in 21 "normal" patients and 12 patients with osteomalacia; lower diagram shows mean urinary excretion of calcium expressed as net percentage of infused calcium (15 mg. per kg. of body-weight).

Patients were classified as having "definite osteomalacia" only if they provided evidence of a cause (all had steatorrhœa and fat-absorption less than 90%), presented unequivocal skeletal rarefaction (usually with fractures) on radiography, and had a serum level of calcium × phosphate below 30 mg. per 100 ml. (table I). In almost every case the serum level of alkaline phosphatase was raised, the phosphate/creatinine clearance ratio was high in relation to their serum-phosphate level (Nordin and Fraser 1954, 1956), and biopsy revealed abnormal bone. Clearly some of the patients classed as having "steatorrhœa" may have had milder osteomalacia, but none of them fulfilled all the three criteria laid down above.

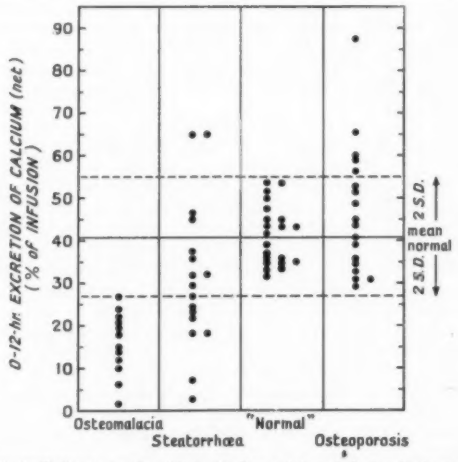


Fig. 2—Individual results obtained after calcium infusion in four main groups of patients.

Normal range, shown between broken lines (27–55%), embraces two standard deviations above and below mean normal excretion of 41% in 12 hr. Note subnormal results in all cases of osteomalacia and 8 of 17 cases of steatorrhœa. See table III for results in miscellaneous cases.

Patients were classified as having osteoporosis if they had definite rarefaction of the vertebral column (usually with "codfish" deformity and crush fractures) without other evident cause—i.e., with normal serum levels of calcium, phosphate, phosphatase, and protein and a normal blood picture.

Results

CHANGES OBSERVED DURING TEST

Fig. 1 shows the mean rise in serum-calcium level and the mean urinary calcium in 21 "normal" patients and

TABLE I—DETAILS OF CASES OF DEFINITE OSTEOMALACIA TESTED

Case no.	Diagnosis	Level in serum (mg. per 100 ml.)			Alkaline phosphatase	Cp/Ccr*	Radiological findings	Bone-biopsy findings	Ca test (0–12-hr. excretion: net % of amount infused)
		Calcium	Phosphorus	Ca × P					
1	Cancer of pancreas ..	9·4	1·8	17	26°	0·5	Milkman fractures	Large osteoid seams	26·8
2	Obstructive jaundice ..	10·2	2·4	25	..	0·20	Thin bones	Possible osteoid seams	24·0
3	Obstructive jaundice ..	10·0	2·6	26	..	0·32	Vertebral collapse. Rib fractures	Possible osteoid seams	23·4
4	Idiopathic steatorrhœa	7·7	2·6	20	23°	0·26	Multiple fractures: ribs, long bones, pelvis	Large osteoid seams	22·5
5	Idiopathic steatorrhœa	8·4	2·2	18	11°	0·40	Vertebral collapse	Possible osteoid seams	20·8
6	Short-circuit	9·3	2·6	24	20°	..	Very thin bones	Possible osteoid seams	19·7
7	Idiopathic steatorrhœa	8·9	1·9	17	46°	0·40	Multiple fractures. Milkman fractures	Large osteoid seams	18·0
8	Obstructive jaundice ..	9·1	2·3	21	..	0·20	Very thin bones	Probable osteoid seams	14·9
9	Obstructive jaundice ..	10·0	1·6	16	..	0·36	Thin bones	Large osteoid seams	12·2
10	Gastro-enterostomy ..	7·5	2·2	16	8·6°	0·25	Multiple fractures. Milkman fractures	Large osteoid seams	10·2
11	Fibrocystic disease of pancreas	9·2	2·9	27	39°	0·22	Very thin bones	Possible osteoid seams	6·0
12	Hepatic jaundice ..	7·9	3·4	27	..	..	Thin bones. Metatarsal fracture	Occasional large osteoid seams	1·5

* Ratio of clearance of creatinine to clearance of phosphate (see Nordin and Fraser 1954).

12 cases of osteomalacia. In the "normal" patients the mean serum-calcium level rose from 10·4 to 13·5 mg. per 100 ml. and in osteomalacia from 9·0 to 11·5 mg. per 100 ml., but in none of the patients were there any signs of calcium intoxication; and twenty hours after the end of this infusion the serum-calcium level had almost invariably returned to its original value. Most of the excess urinary calcium due to the infusion was excreted in the first twelve hours, and we have therefore used the 0–12-hr. net total as our index of calcium excretion to express the result of the test.

NET URINARY CALCIUM EXCRETION 0–12 HOURS

"Normal"

Fig. 2 shows the individual results in the four main groups studied. In the "normal" patients the net 0–12-hr. excretion was 33–53%, with a mean of 41% and a standard deviation of 7·0. The normal range shown in the charts embraces two standard deviations above and below the mean—i.e., 27–55%.

Definite Osteomalacia

In proved osteomalacia all the results were below the normal range (see table I) the highest being 26·8% and the lowest 1·5%. Within the group there did not appear to be any correlation between the amount of calcium excreted and the severity of the disease; the patient with the highest excretion had multiple Milkman fractures and a short history. It should be remembered that the results in vitamin-D-resistant osteomalacia have been excluded.

TABLE II—CASES OF APPARENTLY SIMPLE STEATORRHŒA SUBDIVIDED BY INFUSION TEST INTO THOSE WITH SUBNORMAL CALCIUM EXCRETION (GROUP A) AND OTHERS (GROUP B)

—	Group A	Group B
12-hr. excretion	0–27%	>27%
No. of cases	8	9
No. with steatorrhœa for more than 2 yr.	6	3
No. with bone density definitely normal	1	7
Serum-calcium (mean) (mg. per 100 ml.)	8·2	9·9
Serum-phosphorus (mean) (mg. per 100 ml.)	3·6	3·4
Urinary output of calcium in 24 hr. (mean) (mg.)	49	94

Group A, with low-calcium excretion, had a longer history of steatorrhœa, more suspicious bone radiographs, lower serum-calcium levels, and lower urinary output of calcium on low-calcium diet ($P > 0{\cdot}01$).

Steatorrhœa without proved Osteomalacia

In 8 of these patients the 0–12-hr. net excretion was 27% or less, in 7 it was normal, and in 2 it was increased. The reliability of the infusion test depends on whether the 8 patients with low excretion really had a minor degree of osteomalacia and the others not. This is suggested by the additional data shown in table II.

(1) Most of the patients with a low 0–12-hr. excretion (group A) appeared to have had steatorrhœa for a longer time than had group B;

(2) The radiographic density of the bones was questioned by the clinician or the radiologist in all but 1 of group A, but was normal in 7 of 9 in group B;

(3) The mean serum-calcium and the 24-hour urinary calcium levels were significantly lower in group A than in group B ($P<0{\cdot}01$).

It therefore seems probable that these 8 patients had early osteomalacia, although it could not have been definitely diagnosed in any of them by the conventional procedures, since none of them had definitely abnormal bones on radiography combined with a low Ca × P level in the serum.

It is also worth noting that none of them had a raised serum-alkaline-phosphatase level (except those with jaundice), a low serum-phosphate level, or a raised phosphate/creatinine clearance ratio, in contrast to the definite osteomalacia group.

Osteoporosis

All the results were in or above the normal range.

TABLE III—EXCRETION OF CALCIUM AFTER INFUSION IN MISCELLANEOUS CASES NOT INCLUDED IN FIG. 2

(Vitamin-D-resistant osteomalacia excluded)

Diagnosis	Urinary excretion of calcium in 12 hr. from start of infusion (% of amount infused)	
Prostatic carcinoma with osteoblastic metastasis	4	
Pyelonephritis with renal failure	6	
Diabetes with thin bones	8	
Hypoparathyroidism	11	
Temporary hypoparathyroidism	14	
Hypoparathyroidism	15	
Acromegaly	16	
Parathyroid tumour with renal failure	17	
Rheumatoid arthritis	19	
Adult cœliac disease	24	
Acromegaly	28	
Cœliac disease follow-up	30	Normal range
Osteogenesis imperfecta	30	Normal range
Myelosclerosis	31	Normal range
Chronic bronchitis	31	Normal range
Paget's disease	31	Normal range
Hæmochromatosis	33	Normal range
Hysterical immobilisation	35	Normal range
Chromophobe adenoma	36	Normal range
Cœliac disease follow-up	36	Normal range
Paget's disease	39	Normal range
Polyostotic fibrous dysplasia	43	Normal range
Osteogenesis imperfecta	43	Normal range
Renal stones	48	Normal range
Parathyroid tumour with renal failure	49	Normal range
Cœliac disease follow-up	51	Normal range
Intestinal tuberculosis	53	
Hypercalcuria	53	
Cœliac disease follow-up	57	
Cœliac disease follow-up	65	

Miscellaneous Cases

In most of these cases the net excretion of calcium was normal, but it was less than 27% in 10 (table III). This is hardly surprising in renal failure (2 cases), untreated hypoparathyroidism (3), and prostatic carcinoma with osteoblastic metastases (1). The other 4 "false positives" whose diagnoses are given in table III are at present unexplained.

REPRODUCIBILITY

7 patients have received more than one calcium infusion (usually after an interval of at least a year)

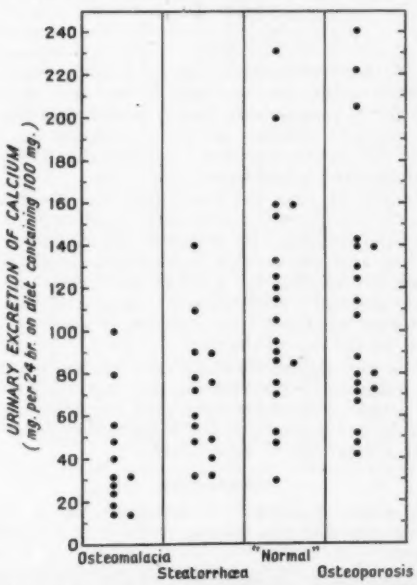


Fig. 3—24-hr. urinary excretion of calcium on third day of diet containing not more than 100 mg. of calcium (same groups as in fig. 2).

without intervening therapy. The results obtained in the two tests agreed closely as follows:

Case no.	Diagnosis	0–12-hr. net calcium excretion 1st test	2nd test
13	Osteoporosis	43 % *	44 % *
14	Rheumatoid	35 %	34 %
15	Pyelonephritis with renal failure	6 %	6 %
16	Renal stones	50 %	46 %
17	" "	43 %	41 %
18	" "	56 %	53 %
19	" "	31 %	29 %

*Gross calcium excretion given because basal excretion not measured.

Value of Test

It may be suggested that measurement of the 24-hr. urinary calcium on a low calcium diet could yield as much information as a calcium infusion. We have not found this to be so. Fig. 3 shows the 24-hr. urinary excretion of calcium on the third day of the low-calcium diet for comparison with fig. 2. The separation of osteomalacia from the normal state by the calcium infusion was clearly not obtained by measurement of urinary calcium alone, nor did the separation improve when the figures were corrected for body-weight. It is possible that better separation could be achieved if the diet were continued for a considerably longer period, but the wide range of 24-hr. urinary output of calcium on a low-calcium diet in our "normal" patients (fig. 3) is similar to that reported by Albright et al. (1929).

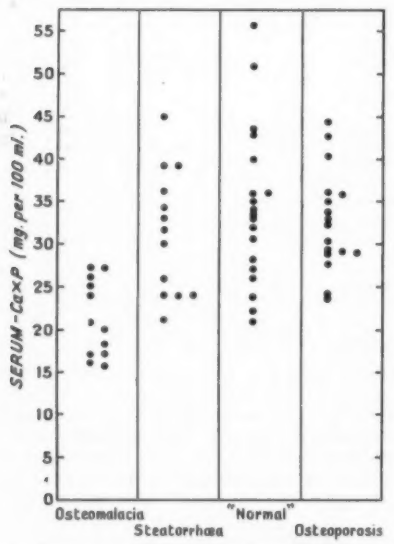


Fig. 4—Serum calcium × phosphate levels (same groups as in fig. 2).

Note less satisfactory separation of groups by these estimations compared with fig. 2.

Similarly, we have not found that the serum level of calcium × phosphate is a sufficiently sensitive guide to the state of the skeleton. By definition, all our osteomalacia cases had a serum calcium × phosphate level below 30 mg. per 100 ml., but fig. 4 shows that some "normal" patients also had a level below 30 mg. per 100 ml. These values were obtained from samples of blood taken at 10 A.M. on the day of the test.

We do not suggest that this infusion test is infallible in the diagnosis of osteomalacia, nor that it will supplant other forms of investigation; but we believe that in doubtful cases it may provide additional evidence for or against a diagnosis of osteomalacia.

Summary

A standard procedure is described for a calcium-infusion test, and the results of the first 98 tests are reported.

The calcium is administered as the gluconate over four hours in physiological saline solution. The dose is 15 mg. of calcium per kg. of body-weight.

The net urinary excretion of calcium during the first twelve hours after the start of the infusion was 33–53% in 21 "normal" patients and 2–27% in 12 patients with definite osteomalacia due to steatorrhœa.

Of 17 other patients with steatorrhœa 8 yielded results in the osteomalacia range. Other evidence suggests that these probably had subclinical osteomalacia.

In 18 cases of osteoporosis the excretion was invariably within or above the normal range.

30 tests in various other conditions in which bone disease might be suspected yielded low excretion figures in 10. 6 of these could be explained by the underlying metabolic disorder; the other 4 remain unexplained.

We wish to acknowledge with gratitude the assistance of Dr. A. Jadresic, Miss Elaine Hunt, Miss Sheila Stewart, and the sisters and nurses of Hammersmith Hospital.

REFERENCES

Albright, F., Bauer, W., Aub, J. C. (1929) *J. clin. Invest.* **7**, 139.
Baylor, C. H., Van Alstine, H. E., Keutmann, E. H., Bassett, S. H. (1950) *Ibid*, **29**, 1167.
Goldman, R., Bassett, S. H. (1954) *J. clin. Endocrin.* **14**, 278.
Howard, J. E., Hopkins, T. R., Connor, T. B. (1953) *Ibid*, **13**, 1.
Kyle, L. H., Schaaf, M., Erdman, L. A. (1954) *J. Lab. clin. Med.* **43**, 123.
McCance, R. A., Widdowson, E. M. (1939) *Biochem. J.* **33**, 523.
Nordin, B. E. C., Fraser, R. (1954) *Clin. Sci.* **13**, 477.
— — (1956) Ciba Conference on Bone Structure and Metabolism (in the press).
Schaaf, M., Kyle, L. H. (1954) *Amer. J. med. Sci.* **228**, 262.
Schilling, A., Laszlo, D. (1951) *Proc. Soc. exp. Biol., N.Y.* **78**, 286.
Spencer, H., Hausinger, A., Laszlo, D. (1954) *J. Amer. geriat. Soc.* **2**, 19.

A CALCIUM-INFUSION TEST

II. "FOUR-HR. SKELETAL RETENTION" DATA FOR RECOGNITION OF OSTEOPOROSIS

J. M. FINLAY
M.D. Toronto, F.R.C.P.(C.)
RESEARCH ASSISTANT,
POSTGRADUATE MEDICAL SCHOOL OF LONDON

B. E. C. NORDIN
M.D. Lond., M.R.C.P.
MEDICAL REGISTRAR, HAMMERSMITH HOSPITAL, LONDON

RUSSELL FRASER
M.D. N.Z., F.R.C.P.
READER IN MEDICINE,
POSTGRADUATE MEDICAL SCHOOL OF LONDON

IN a previous paper (Nordin and Fraser 1956) we reported the pattern of urinary excretion of calcium after a standard infusion in "normal" patients and in certain types of metabolic bone disease. As predicted by earlier workers (Schilling and Laszlo 1951), we found that the urinary excretion of infused calcium was low in osteomalacia due to steatorrhœa; but in only a few cases of osteoporosis was this excretion abnormally high.

Since this test therefore failed to differentiate between osteoporotic and "normal" patients, we decided to elaborate the procedure further. We have measured at the end of the infusion not only the net or excess urinary output of calcium, but also the excess calcium still circulating in the extracellular space. We considered that this method would enable us to calculate the proportion of the infused calcium deposited in the skeleton—i.e., that in neither of these two measured pools (urine and extracellular fluid)—and that this might be low in osteoporosis.

We report here the results obtained with this calculation of "skeletal retention."

Methods

Procedure

The calcium-infusion procedure has been described elsewhere (Nordin and Fraser 1956). The estimations required for the "skeletal retention" data are the basal

urinary excretion of calcium on the previous day, the 0–4-hr. urinary excretion of calcium on the test day, the plasma-calcium at 0 and 4 hr. after the start of the infusion, and, on one of the last samples, the level of ultrafiltrable calcium.

Biochemical Methods

Serum and ultrafiltrable calcium were measured either by a modification of Lehmann's ethylene-diamine-tetra-acetic acid (E.D.T.A.) titration procedure * (Lehmann 1953) or more recently by flame photometry * (McIntyre 1956). Urinary calcium was measured by the standard Kramer Tiddall procedure described by King (1951) or, more recently, by flame photometry.

Ultrafiltration of serum was done by a method which will be described elsewhere (Nordin et al. 1956). The pre-infusion serum was used for this purpose, and it was assumed that the proportion of ultrafiltrable to total calcium remained unaffected by the infusion. This assumption has been tested and found valid (Nordin et al. 1956).

Calculation

The "4-hr. skeletal retention" of infused calcium is estimated at the end of the 4-hr. infusion. To derive this we deduct from the administered dose the amount of infused calcium which can be accounted for in the extracellular fluid (E.C.F.) at 4 hr. and in the 0–4 hr. urine, and express the result as a percentage of the infused dose (which is proportional to body-weight).

For the purpose of this calculation the extravascular fluid is assumed to be 15% and the intravascular fluid 5% of the body-weight (Manery 1954). The level of calcium in the extracellular fluid is assumed to be the same as in serum ultrafiltrate (Manery 1954). The amount of infused calcium appearing in the urine over 0–4 hr. is estimated by deducting $^1/_6$ of the previous 24-hr. urinary output of calcium from the total amount excreted during the infusion—i.e., the net or excess excretion of calcium. The figure obtained when the sum of these three estimations is deducted from the administered dose is expressed as a percentage of the dose and termed "the 4-hr. skeletal retention."

The steps in the calculation are as follows:

Increase in extravascular E.C.F. calcium	= Rise in ultrafiltrable serum-calcium × 15% of body-weight .. .. (a)
Increase in plasma-calcium	= Rise in serum-calcium × 5% of body-weight .. .. (b)
Net urine excretion	= Total 0–4-hr. calcium less $^1/_6$ previous 24 hours' urinary excretion of calcium.. (c)
Calcium not accounted for in E.C.F. or urine or "4-hr. skeletal retention"	= Administered dose −([a] + [b] + [c]) .. .. (d) (expressed as percentage of the administered dose).

Alternative procedures for this calculation, when ultrafiltrable calcium has not been measured, are given in the appendix to this article.

Patients Studied

We have sufficient data to calculate 4-hr. skeletal retention in 54 patients.† They fell into the following diagnostic categories:

(A) *Normal:* this group consisted of 10 patients with no bone disease or disturbance in calcium metabolism. The diagnoses were as follows: peptic ulcer (3), hypertension, cerebral thrombosis (2), pleural effusion, spontaneous pneumothorax, simple obesity, and narcolepsy.

(B) *Proved osteomalacia* (8): in 7 patients with steatorrhœa the radiographic and biochemical findings were typical of osteomalacia (as defined in Nordin and Fraser 1956); and in 6 the diagnosis was confirmed by biopsy of the iliac crest. 1 patient with osteomalacia immediately following removal of a parathyroid adenoma is included in this group.

(C) *Steatorrhœa without proved osteomalacia:* 6 cases.

(D) *Osteoporosis:* this group consisted of 15 patients (13 females and 2 males), of whom 10 had vertebral compression fractures ("definite osteoporosis"). The remaining 5 were classified as "probable osteoporosis" and consisted of 3 cases of Cushing's syndrome, 1 case of rheumatoid arthritis treated with cortisone for two years, and 1 of postmenopausal backache and radiographically "thin bones."

(E) *Miscellaneous:* this group consisted of 15 patients with diseases which might involve bone metabolism and 1 elderly patient with vertebral crush fractures without evident cause whom we have been unable to clarify (see below).

Some of the patients received a low-calcium diet before the infusion, but others did not. No distinction has been made between the two groups.

Results

"4-HR. SKELETAL RETENTION" (INDIVIDUAL RESULTS BY DIAGNOSTIC CATEGORIES) (FIG. 1)

(A) "*Normal*" *Patients*

The "4-hr. skeletal retention" in the 10 "normal" patients was 50–62% of the dose (mean 55·2%). The standard deviation is 3·3%, and two standard deviations above and below the mean embrace the range 48·6–61·8%. Since the normal group consists of only 10 patients, we have shown the absolute normal range on our graphs until we have collected further data.

(B) *Osteomalacia*

In all the 8 patients with osteomalacia the 4-hr. retention of calcium was above the normal range. The highest retention (88%) occurred in the patient who had just undergone parathyroidectomy.

(C) *Steatorrhœa*

Of 7 patients with steatorrhœa without obvious osteomalacia, 5 retained more than 62% of the dose; 1 patient retained 60%, and 1 46%.

(D) *Osteoporosis*

11 patients with osteoporosis retained less than 50% of the dose of calcium at 4 hr. The retention in 4 patients was within the normal range. 1 of these was a "possible" osteoporosis, and the 3 others had been treated with hormones for from 4 months to 5 years. Only 1 of the patients with a low skeletal retention had received any treatment at the time of the infusion.

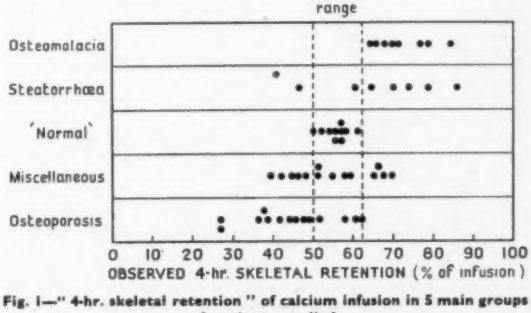


Fig. 1—"4-hr. skeletal retention" of calcium infusion in 5 main groups of patients studied.

Note: (1) normal range of 50–62%; (2) high skeletal retention in each of 8 cases of definite osteomalacia due to steatorrhœa and in 5 of 7 cases of steatorrhœa without obvious osteomalacia; and (3) subnormal skeletal retention in 11 of 15 cases of osteoporosis (contrast 0–12-hr. excretion on same tests in fig. 2 of Nordin and Fraser [1954], abnormal in only 4 of 15).

* Compared estimations were about equivalent on these methods (McIntyre 1956).

† All those patients tested by July, 1955, for whom were available, in addition to urinary data, the required data of ultrafiltrable calcium and the necessary two serum samples, measured by E.D.T.A. or flame photometry. In 1 osteoporotic patient the ultrafiltration measurement was not available, and so the value obtained by the appendix methods has been used.

(E) *Miscellaneous*

The "4-hr. skeletal retention" in this group of patients was 31–59%. Thus none was above the normal range, but the following were below it:

(1) Malnutrition	47%
(2) Acromegaly	46%
(3) Polyostotic fibrous dysplasia	45%
(4) Vertebral compression fractures (unclassified)	41%
(5) Renal calculi	38%

COMPARISON OF "4-HR. SKELETAL RETENTION" WITH 0–12-HR. URINARY EXCRETION

The relationship between these two types of test result is shown in fig. 2, which shows that in 1 of the "normal" patients the 0–12-hr. urinary excretion was less than the lower limit (27%) of the normal range which we have defined in our previous paper; this we cannot explain. The normal range of "4-hr. skeletal retention" is slightly narrower than the range of 0–12-hr. urinary excretion; and this suggests that the more complicated calculation is more precise.

Fig. 2 also shows that in most of the tests the "4-hr. skeletal retention" and the 0–12-hr. urinary excretion of calcium together usually accounted for 95% (85–105%) of the infused calcium. Thus, usually, the "4-hr. skeletal retention" was about equal to the final total retention of calcium, since later urinary and fæcal losses were small; and so both the "4-hr. skeletal retention" and (inversely) the 0–12-hr. urinary excretion of calcium usually gave a good index of the same function, presumably the final skeletal retention.

While in 11 of the 15 patients with osteoporosis the 0–12-hr. urinary excretion was normal, in 7 of these 11 the "4-hr. skeletal retention" was subnormal. It is these 7 cases in which the urinary excretion data were of no diagnostic value, which fact provides the main justification for the rather elaborate procedure described here. 4 osteoporotic patients whose 0–12-hr. urinary excretion of calcium was high also had a low "4-hr. skeletal retention." 3 of these had Cushing's syndrome and the 4th was a case of post-pregnancy osteoporosis (Nordin and Roper 1955).

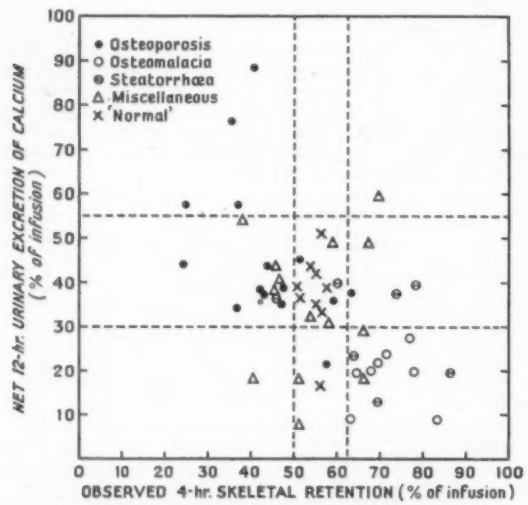


Fig. 2—Correlation between the "4-hr. skeletal retention" and 0–12-hr. net urinary excretion after calcium infusion.

Note: (1) most results lie within lines enclosing all results where these two figures total 85–105%, so that one figure is usually an inverse reflection of the other; (2) tendency of osteoporotic results to lie towards left of this area (i.e., for 0–12-hr. urinary excretion to be more normal than "4-hr. skeletal retention"); and (3) while only 4 of 15 osteoporosis cases show excessive urinary excretion, 7 of the other 11 osteoporotics show subnormal "4-hr. skeletal retention."

All the patients with osteomalacia were found to have the combination of a high "4-hr. skeletal retention" and a low 0–12-hr. urinary excretion. 3 patients with steatorrhœa without obvious osteomalacia showed the same combination. 1 patient with steatorrhœa (who had been given intramuscular vitamin D some months previously) showed a combination of low "4-hr. skeletal retention" with a normal 0–12-hr. urinary excretion, resembling the results seen in osteoporosis.

In only 1 patient (a girl aged 16) with severe hyperthyroidism) was a high urinary excretion of calcium on the test combined with a high "4-hr. skeletal retention." The patient with "vertebral compression fractures without evident cause" was unique in that her "4-hr. skeletal retention" suggested osteoporosis, while her urinary excretion on the test suggested osteomalacia.

Discussion

We have assumed, for the purposes of the present work, that the infused calcium is ultimately either excreted in the urine or deposited in the skeleton, and that only an insignificant fraction will be lost in the fæces. Previous observations on healthy people (McCance and Widdowson 1939, Baylor et al. 1950) are in accord with these assumptions. Certainly at 4 hours, whatever may happen later, any infused calcium which may have reached the gut will be mostly in the small intestine, whose electrolyte contents are normally in equilibrium with the extracellular fluid, and so included in any calculation of the latter's calcium content (Manery 1954).

We have shown that the urinary excretion of infused calcium fell within a fairly narrow range in "normal" patients, and that less was excreted in osteomalacia due to steatorrhœa. In our original series these two groups did not overlap, and we considered that an abnormally low excretion on this test is of diagnostic assistance when this disorder is suspected. The diagnosis of frank osteomalacia, of course, presents no difficulty; but the early diagnosis of incipient cases is impossible at present. Our data suggest that a calcium infusion may serve to distinguish between those cases of steatorrhœa in which osteomalacia is developing and those in which the bones are not so affected. We will be reporting elsewhere in more detail the fact that the urinary excretion in this test is normal in cases of vitamin-D-resistant osteomalacia.

Schilling and Laszlo's (1951) prediction that the excretion of infused calcium would be high in osteoporosis (owing to the failure of the matrix to accept calcium) was not fulfilled (Spencer et al. 1954), and for this there might have been at least two possible explanations: it was quite possible that the osteoporotic skeleton did not differ from the normal skeleton in its ability to accept calcium; but it was also possible that, while the skeleton was rejecting the calcium, the kidneys could not excrete this extra load at a sufficient rate to exceed that of the normals. This suggested that we were perhaps using too large a dose of calcium for our purpose, and that the calcium might be accumulating in the extracellular fluid in the osteoporotic cases. We were reluctant to use a smaller dose of calcium, because of the inevitable increase in the magnitude of the possible error arising from our deriving the excess or net excretion of calcium by deducting the previous day's basal excretion from the observed excretion.

Therefore we decided instead to estimate the amounts of calcium circulating in the extracellular space at the end of the infusion, and so to calculate from this and the urinary excretion the proportion of the dose deposited in the skeleton. This calculation showed that, in 11 out of the 15 cases of osteoporosis, less calcium had been deposited in the skeleton by the end of the infusion than in the "normal" patients. In 7 of these abnormal tests

in osteoporosis the 0–12-hr. urinary excretion did not exceed the normal range; and so we must assume that some of the excess calcium circulating at 4-hr. was either deposited in the skeleton between 4 and 12 hr. or also was lost in the fæces—in either case to an extent greater than in healthy people. Either of these abnormalities might be possible consequences of an excessive rise of plasma-calcium level, as happened in these patients. Thus our results suggest that the "4-hr. skeletal retention" would be more sensitive to defective deposition of calcium than the 0–12-hr. urinary excretion.

The findings in the other patients suggest that the "4-hr. skeletal retention" is a reliable index of the skeleton's avidity for calcium. The normal range is slightly narrower than that of the 0–12-hr. urinary excretion, and it still reveals the excessive skeletal avidity of all the osteomalacia patients tested. Indeed, as noted, it is striking how closely the "4-hr. skeletal retention" reflects the final retention of calcium, or that not excreted in the 0–12-hr. urinary excretion, except in osteoporosis and in defective skeletal avidity. For the recognition of osteomalacia due to steatorrhœa, however, this complication of the test by the estimation of serum levels is unnecessary; and the 0–12-hr. urinary excretion of calcium reliably reveals the excessive avidity for calcium.

The low "4-hr. skeletal retention" which we found in osteoporosis does not necessarily imply any abnormality of the protein matrix in these cases, as suggested by Albright and Reifenstein (1948). The only definite statement that can be made about the osteoporotic skeleton is that it contains less bone than does a healthy one (Follis 1954). This reduction in mass, with its associated reduction in surface area, may explain the reduced rate of deposition of calcium in the skeleton during the test.

The practical value of the calcium-infusion test in osteoporosis remains to be seen, but the possession of even one biochemical criterion of osteoporosis should be valuable to workers in this field, particularly those interested in studying the effects of therapy; and it is just possible that the procedure we have described may meet this need.

Summary

The results of the calcium-infusion test, described in the previous paper, have been analysed to show, in 54 patients, the "4-hr. skeletal retention" of calcium—the proportion of the infused calcium neither in the urine nor in the extracellular fluid at 4 hr.

In 10 "normal" patients this "4-hr. skeletal retention" was 50–62% (mean value 55%). In all of 8 patients with osteomalacia due to steatorrhœa, and in 5 of 7 patients with steatorrhœa without obvious osteomalacia, this "4-hr. skeletal retention" was above the normal.

In 11 of 15 patients with osteoporosis the "4-hr. skeletal retention" was below the normal, although the 0–12-hr. urinary excretion of calcium was abnormal in only 4 of them. We suggest that this "4-hr. skeletal retention" may offer a biochemical criterion for osteoporosis.

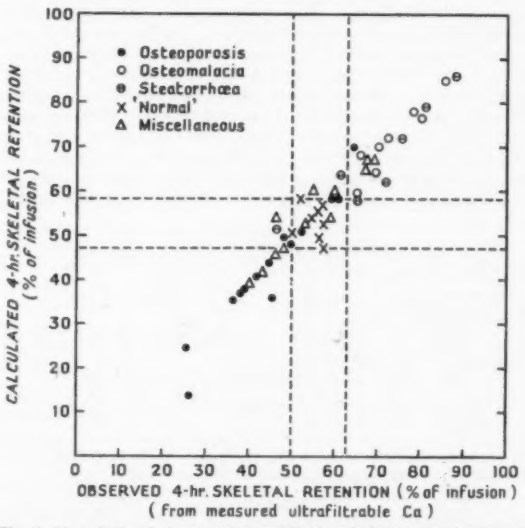


Fig. 3—Correlation between observed "4-hr. skeletal retention" and that calculated by formula correcting for serum-protein levels. See appendix.

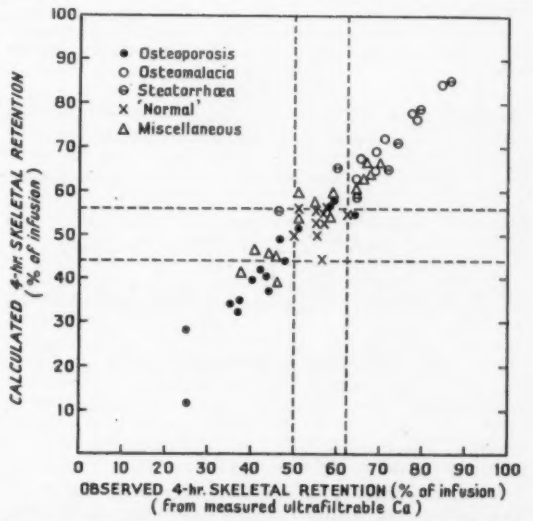


Fig. 4—Correlation between observed "4-hr. skeletal retention" and that calculated assuming normal serum levels. See appendix.

We wish to acknowledge with gratitude the assistance of Miss Sheila Stewart, B.SC., and of the sisters and nurses of Hammersmith Hospital; and to thank Mr. C. R. Brecknall and Mr. F. Saunders, of the illustration department of the Postgraduate Medical School of London, for the illustrations, and several colleagues for referring patients.

Appendix

The procedure described above involves the ultrafiltration of serum. We have, however, recalculated all our data in two ways which eliminates this necessity.

(a) *Correcting for plasma-protein levels* (fig. 3).

We may calculate the percentage of calcium which is ultrafiltrable from the albumin and globulin concentrations according to a formula which we are publishing elsewhere (Nordin et al. 1956). (Protein bound Ca % $= -3{\cdot}1 + 7{\cdot}6 \times$ albumin (g. per 100 ml.) $+ 2{\cdot}9 \times$ globulin (g. per 100 ml.).)

In fig. 3 the results obtained by this calculation are compared with those obtained in the same cases by measurement of the ultrafiltrable calcium. It will be seen that there is very little difference in the results, although the absolute normal range by this calculation becomes 47–58 instead of 50–62%. The number of osteoporotic patients with subnormal retention becomes 9 or 10 instead of 11 out of 16.

(b) *Assuming normal plasma-proteins* (fig. 4).

We have assumed that, with normal plasma-proteins, the ultrafiltrable calcium is always 67% of the total serum-calcium (Nordin et al. 1956).

The total circulating extracellular calcium thus becomes the sum of:

(i) Rise in serum-calcium level $\times$ 5% of body-weight, and

(ii) Rise in serum-calcium level $\times \frac{67}{100} \times 15\%$ of body-weight.

This solves to: [rise in serum-calcium level $\times$ 15% of body-weight.

Fig. 4 shows the results obtained with this calculation. The normal range becomes 44–56%. Again 9 of 15 osteoporotic cases retained less than the normal proportion of the dose.

REFERENCES

Albright, F., Reifenstein, E. C. jun. (1948) The Parathyroid Glands and Metabolic Bone Disease. Baltimore.
Baylor, C. H., Van Alstine, H. E., Keutmann, E. H., Bassett, S. H. (1950) *J. clin. Invest.* **29**, 1167.
Follis, R. H. jun. (1954) *Bull. rheum. Dis.* **4**, 52.
King, E. J. (1951) Micro-Analysis in Medical Biochemistry. London.
Lehmann, J. (1953) *Scand. J. clin. Lab. Invest.* **5**, 203.
McCance, R. A., Widdowson, E. M. (1939) *Biochem. J.* **33**, 523.
McIntyre, I. (1956) *Ibid* (in the press).
Manery, J. F. (1954) *Physiol. Rev.* **34**, 334.
Nordin, B. E. C., Finlay, J. M., Fraser, R. (1956) In preparation.
— Fraser, R. (1956) *Lancet*, i, 823.
— Roper, A. (1955) *Ibid*, i, 431.
Schilling, A., Laszlo, D. (1951) *Proc. Soc. exp. Biol., N.Y.* **78**, 286.
Spencer, H., Hausinger, A., Laszlo, D. (1954) *J. Amer. geriat. Soc.* **2**, 19.

ROSEOLA INFANTUM
AN ISOLATED OUTBREAK

N. D. REIS

M.B. Lond.

CAPTAIN, R.A.M.C.

A SMALL outbreak of roseola infantum in April and May, 1955, was confined to a single block of married quarters in Kensington Village, then the largest British-Army families' cantonment in Fayid, Suez Canal Zone.

Epidemiology

The block of quarters involved in this isolated outbreak consisted of eight rooms forming a long bungalow. A separate stone-built ablutions block stood at the back of the main building, each family having its own bathroom and bucket latrine. The children associated with one another daily. This block was surrounded by other similar blocks at distances of 20–100 yards. Meals were eaten communally in a dining-hall. The accompanying table shows the cases.

There was no case outside this block. The source of infection was not found. The only unaffected child living in this block was the eldest ($9^1/_2$ yr.) of three in rooms 6, 7, and 8. Five girls and two boys were affected. No adults were affected. Only one child (case 3) was of school age; he remained at school throughout, not having reported sick. In each family the younger child was affected first, suggesting that incubation may be lengthened by age. Cases 6 and 7 arrived in Fayid from the U.K. on May 1, 1955; they were the last two cases and pyrexia developed on May 5 and May 8 respectively, a fact which sets a maximum of 4 and 7 days on their respective incubation periods. An incubation period of 2–5 days seems probable for this series as a whole.

Other infectious fevers in the village at the time were measles, scarlet fever, and chickenpox.

Clinical Manifestation

The clinical manifestations were very similar in all the cases. The onset took place with mild pyrexia lasting $2^1/_2$–3 days, with temperatures of 101–102°F on the first 2 days and 99–100·6°F on the last day. At this stage no further clinical signs were noted except in case 4, who had nasal catarrh and mild conjunctival injection. None had noticeable faucial, palatal, or pharyngeal injection. The children were listless and fretful. On the 3rd day the pyrexia suddenly collapsed after the appearance of the rash. The exanthem was of rose maculopapules 2–10 mm. in diameter. The rash, always discrete and nowhere confluent, began on the face and spread rapidly to the upper limbs and neck and reached the back and abdomen in a few hours. Its maximal spread and intensity were reached within 24 hours. The final distribution was centripetal, the macules becoming very scanty towards the extremities, and the hands and feet being free. The greatest concentration of macules was on the face, upper arms, and back. Within a few hours of the appearance of the rash the children all felt perfectly well again, and confinement to bed and house became difficult. Many of the maculopapules were surrounded by a striking zone of pallor giving them the appearance of being encircled by a white ring. This appearance is stated to be pathognomonic of roseola infantum (Zahorsky 1947). The rash faded away slowly in 3 or 4 days, leaving no stain or scaliness of the skin.

DATA ON CASES

Case no.	Room nos.	Age (yr.)	Sex	Date of rash
1	1 and 2	3	F	April 29, 1955
2	5	2	F	May 1, ,,
3	1 and 2	8	M	,, 2, ,,
4	6, 7, and 8	$1^3/_4$	M	,, 4, ,,
5	6, 7, and 8	$2^3/_4$	F	,, 6, ,,
6	3 and 4	$2^3/_4$	F	,, 7, ,,
7	3 and 4	4	F	,, 11, ,,

Discussion

The clinical picture and incubation period are those of roseola infantum, but enlargement of occipital lymph-glands, catarrhal tympanitis, and palatal injection, described by Clemens (1945), Windorfer (1954), and McQuitty (1955), were absent.

After seeing these few cases I am convinced that this infectious fever is a separate entity—a claim which is often denied. Some workers claim that it is atypical rubella. In this series too it was considered whether a common rubella contact could have caused the outbreak, with small variations in the incubation periods; but cases 6 and 7, which were typical, prove that the incubation period of this group was far too short for rubella. The β-hæmolytic streptococcus is also sometimes cited as the cause, but clinically roseola infantum has no resemblance to scarlet fever.

The isolation of this outbreak in a single block is curious and unexplained. Among the young children of the block it was highly infectious; yet it did not spread through the school from case 3 or through the communal dining-hall from any of the cases during the incubation period. This suggests that droplet case-to-case spread is unlikely. Spread through intimate contact alone was a possible explanation. The isolation of the outbreak to the one block led to a search for a common source of infection there. Food or water borne infection was unlikely but could not be entirely excluded. Feeding was communal, and the water-supply came from the same mains as that of surrounding blocks. In these circumstances one would have expected other cases to arise. The block cleaner or one of the adults on the block may have been a carrier or, more likely, the bearer of fomites. The animals in this block consisted of some resident cats and several stray dogs, which spent most of the day there. These again were possible carriers. An alternative to the suggested case-to-case spread by intimate contact is therefore a common undiscovered source in the block.

Summary

A curious and isolated outbreak of 7 cases of roseola infantum is described.

Maximal incubation periods of 4 days and 7 days were found in two cases.

Certain commonly observed signs were absent, and no complications were noted.

Roseola infantum is a striking separate entity.

I wish to thank Dr. J. Fleming, late captain, R.A.M.C., my colleague at the time; Dr. H. W. S. Francis, late captain, R.A.M.C., for suggesting the diagnosis; and Major-General F. J. O'Meara, Colonel M. F. H. Kelleher, and Colonel E. P. H. Lassen for encouragement and invaluable help.

REFERENCES

Clemens, H. H. (1945) *J. Pediat.* **26**, 66.
McQuitty, E. L. (1955) *Brit. med. J.* i, 1005.
Windorfer, A. (1954) *Dtsch. med. Wschr.* **79**, 1201.
Zahorsky, J. (1947) *Arch. Pediat.* **64**, 579.

CONTROL OF ALDOSTERONE EXCRETION BY CHANGES IN VOLUME OF BODY-FLUID

ALEX F. MULLER
M.D.

ANNE M. RIONDEL
Ing. chem.

RENÉ S. MACH
M.D.

From the Department of Medicine in the University of Geneva, Clinique Therapeutique, Hôpital Cantonal

VASOPRESSIN, a long-acting extract of the posterior lobe of the pituitary gland, administered to normally hydrated people for three days, produces acute retention of water, and the resulting abnormal increase of the body-fluid evokes, by homœostasis, renal loss of sodium and chloride (Leaf et al. 1953). The urinary excretion of sodium has also been increased by acutely overloading healthy people with water (Stewart and Rourke 1942) and by giving an infusion of hypotonic saline solution (Strauss et al. 1952).

According to Leaf et al. (1953) this loss of electrolyte can be prevented by administering either corticotrophin or a low-sodium diet. Since the latter stimulates the urinary excretion of aldosterone, it seems reasonable to assume that the increased renal excretion of sodium which follows the increase of body-fluid may be due to diminished production of aldosterone, and that the striking retention of sodium after vasopressin has been withheld might be secondary to increased secretion of aldosterone by the suprarenal cortex.

Methods

The subject studied was a healthy man, aged 32, maintained on a constant low-sodium diet and a fluid intake of 2000–2500 ml. a day. After an initial control period posterior-pituitary extract was administered intramuscularly as vasopressin tannate in oil every twelve hours.

Urine was collected every twelve or twenty-four hours, from 7 A.M. and analysed for sodium in a flame-photometer. The urinary 17-hydroxycorticoids were determined according to a modification of Reddy's method (Hertoghe et al. 1955). Aldosterone was analysed chromatographically after acidification of the urine at pH 1 for twenty-four hours (method *d* of Neher and Wettstein [1955]).*

Results

The accompanying figure shows the typical response of a healthy person to vasopressin tannate over two and a half days, as described by Leaf et al. (1953). The retention of water as the antidiuretic effect of vasopressin is seen in the abrupt decrease in volume of the urine and the corresponding increase in body-weight. As expected, on the second and, especially, the third days of administration of vasopressin the urinary sodium increased. Though the appearance of increased excretion of electrolytes was delayed, making a direct action of vasopressin on sodium very unlikely, there was an immediate decrease in the urinary excretion of aldosterone following the retention of water and the abnormal increase of body-fluid. It is therefore highly probable that this decreased urinary excretion of aldosterone, as a direct consequence of increase of body-fluid, caused secondarily the delayed renal loss of sodium.

The withholding of vasopressin was followed by a large water diuresis and a loss of body-weight. This significant diminution of body-fluid took place pari passu with an increased urinary excretion of aldosterone. The latter was the immediate cause of the pronounced retention of sodium three days after vasopressin had been withheld. The fact that the urinary excretion of aldosterone remained high for several days can be explained by the body-fluid volume expressed as body-weight being below the level found at the beginning of the study.

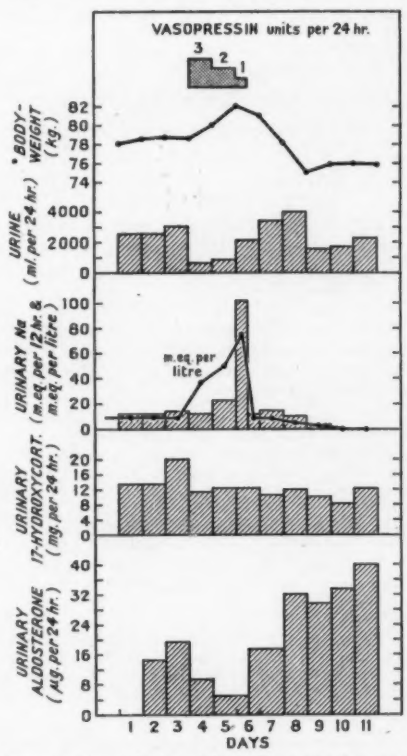
During the whole of this investigation the amount of urinary 17-hydroxycorticoids did not show any significant change.

Discussion

Leaf et al. (1953) interpreted the renal loss of sodium resulting from retention of water as a homœostatic response to abnormal increase of body-fluid. That this increased urinary excretion of electrolytes in man is a direct effect of decreased production of aldosterone is suggested by the results of the present study. The sequence of events after the administration of vasopressin is as follows: (1) retention of water; (2) decrease of secretion of aldosterone as a homœostatic response to increase of body-fluid; and (3) increase in urinary excretion of sodium as a direct consequence of the diminution of aldosterone.

Withholding the vasopressin reverses the process: (1) a large water diuresis causes a loss of weight; (2) the diminution of body-fluid stimulates the production of aldosterone; and (3) pronounced renal retention of sodium.

The significant variations in the amount of aldosterone excreted, in spite of a constant amount of 17-hydroxycorticoids excreted throughout the whole study, strongly suggest an adaptive mechanism which, independent of any effect of corticotrophin and acting through some volume of body-fluid, regulates the secretion of aldosterone in favour of homœostasis. In a recent similar experiment (A. F. Muller and A. M. Riondel, unpublished), however, exogenous corticotrophin was found to influence the excretion of aldosterone. The "rebound" production of aldosterone after vasopressin has been withheld was much increased and hastened by an injection of corticotrophin twelve hours after the last dose of vaso-



Effect of vasopressin on body-weight, volume of urine, and urinary excretion of sodium, 17-hydroxycorticoids, and aldosterone. The relatively high values of aldosterone are due to the constant low-sodium diet with its effect on the volume of the body-fluid.

* We wish to thank Dr. A. Wettstein and Dr. R. Neher for their valuable help in setting up this method in our laboratory.

pressin. Other experiments (Falbriard et al. 1955) indicated that the secretion of aldosterone was possibly stimulated by corticotrophin.

Conclusion

Our experiment demonstrates a homœostatic mechanism affecting the secretion of aldosterone as a consequence of changes in the volume of body-fluid. This regulation seems to be independent of the pituitary-adrenal system. Liddle et al. (1955) note a diminution of the sodium-retaining factor in the urine of dogs and man after the administration of vasopressin, and they suspect that it is not the serum-sodium level but the volume of the body-fluid that influences the secretion of aldosterone. Apart from this homœostatic regulation of the production of aldosterone by some volume of body-fluid, the production of aldosterone probably also depends on corticotrophin. Studies are now in process to establish which fluid compartment may be involved in this homœostatic regulation of aldosterone.

Summary

Evidence is presented that the urinary excretion of aldosterone is controlled by some volume of the body-fluid.

This homœostatic regulation of the secretion of aldosterone is independent of the secretion of corticotrophin, but corticotrophin nevertheless can also influence the secretion of aldosterone independently.

REFERENCES

Falbriard, A., Muller, A. F., Neher, R., Mach, R. S. (1955) *Schweiz. med. Wschr.* **85**, 1218.
Hertoghe, J., Crabbé, J., Duckert-Maulbetsch, A., Muller, A. F. (1955) *Acta endocr., Copenhagen*, **20**, 139.
Leaf, A., Bartter, F. C., Santos, R. F., Wrong, O. (1953) *J. clin. Invest.* **32**, 868.
Liddle, G. W., Bartter, F. C., Duncan, L. E. jun., Barber, J. K., Dolea, C. (1955) *Ibid*, **34**, 949.
Neher, R., Wettstein, A. (1955) *Acta endocr., Copenhagen*, **18**, 386.
Stewart, J. D., Rourke, G. M. (1942) *J. clin. Invest.* **21**, 197.
Strauss, M. B., Davis, R. K., Rosenbaum, J. D., Rossmeisl, E. C. (1952) *Ibid.* **31**, 80.

INGUINAL ENDOMETRIOSIS

THOMAS L. DORMANDY
M.B. Lond., B.ès Sc. Geneva
LIEUTENANT, R.A.M.C.; LATE SURGICAL REGISTRAR, HACKNEY HOSPITAL, LONDON

IN 3 patients seen within five months in the surgical outpatient department of the Hackney General Hospital a fairly confident clinical diagnosis of inguinal endometriosis was confirmed.

This rare condition was first reported by Cullen in 1896. Thirty years later Polster, in a collective review of over 1000 cases of endometriosis, found 34 inguinal lesions, including intraperitoneal and the apparently less common extraperitoneal deposits.

There was no inguinal localisation in a number of later series (Pumphrey 1937, Moss 1939, Dreyfuss 1940, Colcock and Lamphier 1950); but a very unusual case was included in Sanders's survey (1943): a patient who bled from a sinus opening in the groin, during her periods. Masson (1945) reviewing 2686 recorded cases of endometriosis, affecting 4365 sites, found no example of inguinal endometrioma though he noted 2 cases with deposits in femoral hernial sacs. Fallon et al. (1950) found 1 in 400 cases of external endometriosis and Scott and Te Linde (1950) 4 in 514 cases.

In 1954 Daro et al. wrote:

"In a survey of the 3250 cases of external endometriosis reported during the past 17 years, there were only 26 (0·8%) in which the condition was localised in the round ligament, and only 13 (0·4%) in which it was definitely demonstrated to be in the extraperitoneal part."

This bears out Counsellor's statement (1948), that contrary to what the close anatomical relationship between pelvic organs and inguinal canal would lead one to expect, the latter is one of the rarest sites of endometriosis.

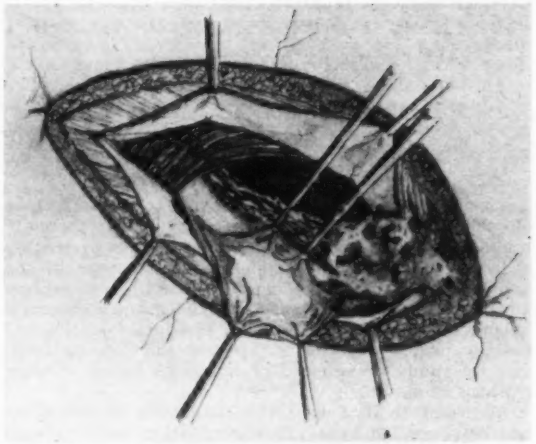


Fig. 1—Operative exposure of the inguinal endometrioma in case 1. The canal of Nück has been opened.

Among individual cases described in clinical detail are those of Cullen (1920), Sampson (1925), Dickinson (1939), Lyall (1945), Mazza (1949), Rubinstein and Kurzon (1952), Daro et al. (1954), and Labry and de Mourgues (1954).

Case-reports

THE FIRST CASE

Mrs. A, aged 38, was referred to the outpatient department with "recurrent inguinal lymphadenitis." She gave a fifteen years' history of a painful lump in her right groin which regularly increased in size two or three days before her periods. At the same time the pain and tenderness became more intense. She had already had two courses of injections—one from her own doctor, and one in the casualty department at another hospital—but neither had benefited her more than temporarily.

During her most recent menstrual period the pain in her groin had kept her confined to bed for seven days and had reduced her to exhaustion.

Apart from the inguinal pain she had never suffered from any form of menstrual discomfort, intermenstrual bleeding, vaginal discharge, backache, or dyspareunia. During the past ten months she had noticed a lengthening of the intermenstrual period and a diminishing loss. Her general health was excellent.

She had one son, aged 17, whose delivery had been normal. Three years after his birth she was operated on for a right tubal pregnancy. Three years after this she had a miscarriage.

Examination

A lower right paramedian abdominal incision was soundly healed and not tender. There was moderate tenderness and diffuse induration over the right external inguinal ring, but no redness, subcutaneous œdema, or enlarged lymph-nodes. A faint but definite cough impulse was present in both groins. Rectal and vaginal examination were negative. The diagnosis of endometriosis of the canal of Nück was made.

Operation

Through an inguinal skin-crease incision a grey mass of fibrous consistence, the size of a cherry, was displayed. It overlapped the external ring and was densely adherent to the external oblique aponeurosis, the emerging round ligament, and the fat of the abdominal fascia. The inguinal canal contained an empty indirect hernial sac which reached the fibrous mass and was inseparable from it. On opening the sac the glistening peritoneal surface appeared intact (fig. 1). The sac was divided and its proximal end closed. In separating and removing the distal part, together with the fibrous nodule and round ligament, small cysts were entered, and dark fluid escaped. The internal ring was obliterated, the inguinal canal reinforced with floss nylon darn, the external oblique aponeurosis sutured, and the skin closed with drainage.

Follow-up

The patient made an uneventful recovery. Since her discharge she has had several menstrual periods without recurrence of symptoms.

Histology

The excised nodule contained uterine glandular and muscular elements, interspersed with blood-filled spaces (fig. 2). Red blood-cells also appeared in the lumen and stroma of the glands which were lined by darkly-staining columnar cells. In several sections the round ligament could be seen traversing the central part of the endometrioma. The endothelial layer of the hernial sac was separated from both by dense fibrous tissue.

THE SECOND CASE

About Mrs. B, a clerk aged 49, her family doctor wrote: "... there is a cystic, tense swelling in the right groin. At first I thought it was a hernia but I am now inclined to think that it might be a hydrocele of the canal of Nück. If it is, then it is the first I have seen in twenty years. ..."

The swelling had appeared abruptly three months previously; it had rapidly increased in size and had become "agonisingly painful." On direct questioning the patient readily confirmed that the onset had coincided with the first day of a menstrual period, and that after menstruation the symptoms had disappeared as quickly as they had come.

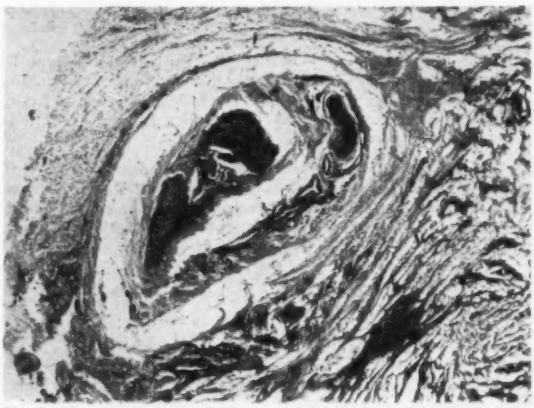


Fig. 2—Microphotograph of the round ligament and inguinal endometrioma in case I. (Low magnification. Hæmatoxylin and eosin.)

The next "acute attack" had occurred during the following period, four weeks later, and the latest episode had ended three weeks before admission.

Over the past twenty years she had noticed from time to time tenderness and mild discomfort in her right groin, but this was not associated with menstruation. Her cycles had been regular and there were no gynæcological symptoms. She had been married for twenty-one years, and, though both she and her husband had been anxious to have a family, their union had remained childless.

Examination

In the right groin a firm, non-tender swelling, the size of a walnut, was palpable. One observer in addition to the patient's doctor, who had seen her in the acute phase, recorded a cystic sensation imparted by the lump, but there was no suspicion of a cough impulse and the mass was not only irreducible but firmly anchored to underlying structures. The skin was freely moveable over it and of normal appearance. Rectal examination was negative.

Operation

Operation was preceded by a pelvic examination under anæsthetic. The uterus was slightly and somewhat irregularly enlarged but no abnormality of the external genitalia or uterine adnexa was found.

Exploration through an inguinal skin-crease incision revealed a mass issuing from the external ring and obscuring the round ligament and its companion structures. It had the colour and consistence of scar tissue; but cystic spaces, varying in size from a pin-head to a lentil, were visible as dark patches through the transparent fibrous covering. Unlike the mass in our first patient, this one showed no tendency to infiltrate; indeed, a clear plane of cleavage made it appear encapsulated. The inguinal canal sheltered an empty indirect sac whose distal extremity was lightly tethered to it. The hernial sac was transected, its proximal end was sutured, and the contents of the inguinal canal were excised.

Pathology

The excised mass had an almost honeycomb appearance; the content of the cysts, reminiscent of that of ovarian "chocolate cysts," stained their lining dark brown. On everting the fundus of the hernial sac there was no evidence of endometrial tissue arising directly from the peritoneal lining.

Tubular glands, surrounded by abundant musculature, were seen under the microscope. They showed the characteristic tortuosity and scalloping of premenstrual endometrium. A number of macrophages with deeply staining, mottled cytoplasm were congregating in the subendometrial layer.

Follow-up

Menstruation started three days after operation and passed without discomfort or reappearance of the lump. The next two menses were similarly uneventful.

THE THIRD CASE

Mrs. C, aged 40, complained of a "nagging pain" in the right groin of three or four years' duration which not only limited her outdoor activities but had lately started to interfere with her regular household duties. In reply to leading questions she said that, though the discomfort was present most of the time, it was worse during menstruation. She had also noticed, on occasion, a small swelling in the groin; but this, she maintained, had been present on and off since childhood.

She had been married for twenty-four years but there had been no pregnancies.

Examination

In the right groin faith rather than touch demonstrated an irregular thickening, overlying and adherent to the body of the pubis. This area was moderately tender and the patient complained of aching after palpation. There was no cough impulse and she had no palpable lymph-nodes. Routine investigations and pelvic examination under anæsthetic again revealed nothing abnormal.

Operation

Operation was performed two days after the end of a menstrual period. The principal finding was a mass, about an

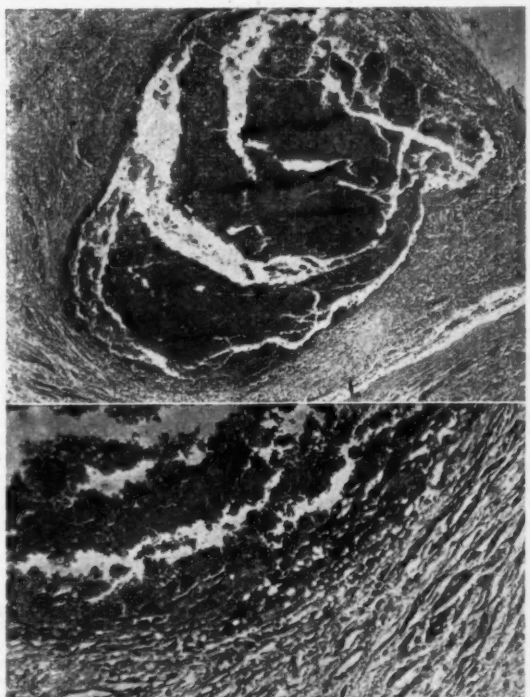


Fig. 3—Microphotograph of an inguinal endometrioma removed two days after cessation of menstruation (case 3). (Low and high magnification. Hæmatoxylin and eosin.)

inch and a half in diameter, spreading over the insertions of the inguinal ligament, the conjoint tendon, and the anterior rectus sheath and densely adherent to the subfascial fat and pubic periosteum. It was of an almost cartilaginous consistence but enclosed three cystic areas which contained pale-green fluid; it was associated with an empty indirect hernial sac and a dilated and tortuous pampiniform plexus.

The mass, the round ligament, the plexus, and the fundus of the sac were excised, and the posterior wall of the inguinal canal was repaired.

Histological Examination

Endometriosis was seen in an atrophic phase (fig. 3): the glandular clefts were in part denuded of their lining layer; scanty muscle tissue was interspersed with hyalinised patches of fibrosis; and there was but one central area, surrounding a small blood-filled space, which contained macrophages in any number.

Follow-up

Since her operation the patient had two menstrual periods without discomfort. She is completely relieved of her nagging pain.

Discussion

Though endometriosis is increasingly diagnosed in gynæcological departments I could find no mention of the inguinal variety in six standard general surgical textbooks (four British and two American) and two books on diagnosis.

Diagnosis

Despite the characteristic history a preoperative diagnosis is but rarely made.

Hernia.—Hernia was diagnosed in the majority of reported cases.

The patient of Daro et al. (1954) was not only forewarned of impending menstruation by the appearance of the inguinal pain, but she could foretell whether the loss would be slight or heavy by its intensity. Despite this history, and the swelling which appeared with the onset of the period, the condition was thought to be a strangulated omentocele. "As a general rule," reflects Daro, "the symptoms of inguinal endometriosis are rather uniform. . . . However, this condition is so rare that endometriosis is seldom considered as the exciting factor in the train of events."

In Labry and de Mourgues's patient (1954) the "hernia" appeared suddenly after unaccustomed exercise. It was at first easily reducible and freely transmitted the cough impulse.

In all our three patients a patent canal of Nück was present and in two a cough impulse could be elicited. It is also possible, if the endometrioma is small and mobile, to perform a *réduction en masse* into the inguinal canal. Not only may this lead to the wrong preoperative diagnosis, but even at operation the familiar sight of a peritoneal sac may divert attention from a comparatively inconspicuous endometrial nodule.

Inguinal Lymphadenitis.—Novak (1947) pointed out the pitfall of enlarged inguinal lymph-nodes. As the painful endometrial swelling tends to disappear at the end of each period, spurious cure follows any treatment; and when an antibiotic has been used, this is regarded as proof of its infective origin. Only the first of our patients mentioned spontaneously that her attacks coincided with her periods: the other two had not connected the two events in their own mind.

Unlike inguinal lymphadenitis with its multiple nodules, inguinal endometrioma usually presents as a solitary lump, or, in the quiescent state, as diffuse induration rather than as a well-defined mass.

Varicocele of the round ligament.—I recently operated on a patient who gave a history of a painful lump in the groin which had appeared three times with the approach of menstrual periods, and had disappeared each time shortly after the bleeding had stopped. In the groin she had an ill defined, partially reducible, tender swelling which transmitted the cough impulse. Exploration for "yet another case of endometriosis," revealed a tortuous and partially thrombosed pampiniform plexus.

Though uncommonly diagnosed, this condition is not rare; and it shares with endometrioma a periodicity of symptoms which is governed by the menstrual cycle. Varicoceles may become painful and prominent in the premenstrual phase, as they do during the first few months of pregnancy; and thrombosis in the dilated veins results in a firm, tender, irreducible swelling (Tomkinson and Winterton 1955).

Pathology

Three forms of inguinal endometriosis have been described.

1. Sampson (1927) in a classical paper advanced endometriosis of hernial sacs as one of his arguments in favour of his "spill" hypothesis. This intraperitoneal variety—which includes endometriomata arising from cysts of the canal of Nück—could also be derived from endometrial islands in the peritoneal serosa (Ivanoff 1898, Meyer and Kitai 1924).

2. Less commonly, endometriomata are found extraperitoneally. In our 3 cases, though hernial sacs were present, careful naked-eye and microscopic examination revealed no continuity between the intact peritoneum and the endometrioma. For this group "endometriosis of the round ligament" is a description *faute de mieux*: in our sections this structure was clearly defined, but in none did it contain ectopic uterine tissue.

3. Endometriomata may also appear in the form of lymph-node deposits, supporting, in MacLeod's view (1950), the hypothesis of lymphatic spread. Such deposits can be histologically distinguished from the foregoing types by the absence of all muscle tissue.

In our 3 cases one could judge from the microscopic section the approximate phase of the menstrual cycle at which the operation was performed. The inguinal endometrioma removed from a pregnant patient by Rubinstein and Kurzon (1952) showed advanced decidual changes.

In these 3 patients—as in 9 out of 12 cases individually reported in the literature—the endometrioma was on the right side.

Treatment

All symptoms were relieved by excision of the endometrioma in our patients, and in view of their age, recurrence is unlikely.

Summary

3 patients with inguinal endometriosis were seen within five months in a surgical outpatient department. All 3 complained of a painful lump in the groin which recurred with each menstrual period.

Unless this history is elicited, there may be difficulty in distinguishing this condition from hernia, enlarged inguinal lymph-nodes, or a thrombosed varicocele. Any of those may coexist, and distract attention from the endometrioma at operation.

The literature of inguinal endometriosis is reviewed and three pathological types are recognised: an intraperitoneal and an extraperitoneal variety, and the purely endometrial lymph-node deposit.

Like congenital hernias and undescended testicles the condition appears to be commoner on the right side than on the left.

Treatment by excision brought complete relief in all 3 cases.

I should like to thank Mr. J. R. Stead for permission to publish these cases, for guidance and encouragement, and Miss Gladys H. Dodds for helpful criticism and advice.

REFERENCES

Colcock, B. P., Lamphier, T. A. (1950) *Amer. J. Surg.* **131**, 507.
Counsellor, V. S. (1948) *J. int. Coll. Surg.* **11**, 29.
Cullen, T. J. (1896) *Bull. Johns Hopk. Hosp.* **7**, 112.
— (1920) *Arch. Surg.* **1**, 215.
Daro, A., Capos, N., Basegra, R. (1954) *J. int. Coll. Surg.* **21**, 3.
Dickinson, A. M. (1939) *Amer. J. Obstet. Gynec.* **38**, 720.
Dreyfuss, M. L. (1940) *Ibid*, **39**, 95.
Fallon, J., Brosman, J. T., Manning, J. J., Meyers, J., Fletcher, M. F. (1950) *R. I. med. J.* **33**, 15.
Ivanoff, N. S. (1898) *Mschr. geburtsh. gynäk.* **7**, 295.
Labry, R., de Mourgues, A. (1954) *Bull. Fed. Soc. Gynéc. Obstét.* **6**, 3.

References continued at foot of next column

BARBITURATE COMA WITH HYPOTHERMIA

D. W. EASON M.B. St. And.
F. I. MACNAUGHTON M.B. Edin.
LATE HOUSE-OFFICERS, ARBROATH INFIRMARY

VARIOUS methods have been used in the past for treating barbiturate coma. Cerebral stimulants in the form of amphetamine derivatives and picrotoxin appear to have little effect when coma is deep, and purely supportive measures have recently tended to take the place of these drugs (Locket and Angus 1952). More recently two new drugs, bemegride and amiphenazole, the latter a respiratory stimulant and both barbiturate antagonists, have been introduced.

An opportunity for comparing the effectiveness of these methods of treatment arose when a case presented in a small country hospital where the new drugs were not immediately available and treatment in the first instance was with picrotoxin, methedrine, and supportive measures. Later, with persistent coma, treatment with bemegride and amiphenazole was given. Further interest is added to the case by the complicating factors of exposure and hypothermia.

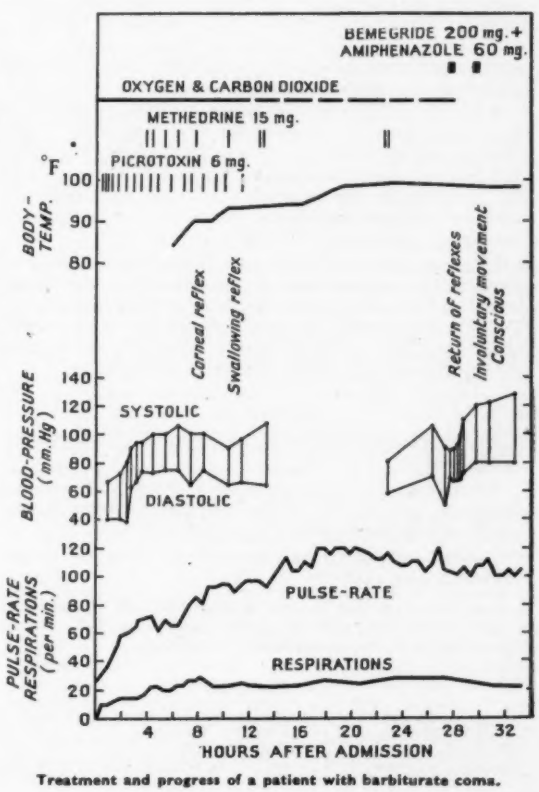
Case-report

A married woman, aged 35 and weighing 105 lb., disappeared from her home on the morning of Oct. 15, 1955, and twenty-six hours later was found lying below the cliffs on the sea-shore, apparently moribund. She was dry but lightly clad (light coat, cotton house-coat, cotton underwear, shoes, and stockings). The maximal and minimal environmental temperatures during the night of her exposure were 58°F and 45°F respectively. Investigations showed that she had taken at least 21 'Carbrital' capsules, representing at least gr. $31\frac{1}{2}$ of soluble pentobarbitone and gr. 84 of carbromal. In addition she had probably taken phenobarbitone and aspirin.

On admission to hospital at 10.45 A.M. on Oct. 16 she was an ashen grey colour, and her whole body was cold. She was pulseless, and her blood-pressure was not recordable. Faint heart sounds were present at the rate of 25 a minute with much-prolonged systole showing by the spacing of the heart sounds. Her respirations were shallow and irregular, from 1 to 3 a minute. All her reflexes were absent and her pupils dilated. A small amount of salicylate was detected in her urine. There was no evidence of trauma.

Treatment.—An endotracheal tube was passed, through which oxygen with 10% carbon dioxide was administered mechanically with a Boyle's apparatus. After fifteen minutes, respiration having become regular, the concentration of carbon dioxide was reduced to 5%. Warmth was applied and, later, a heat cage at its lowest setting was used intermittently. The stomach was washed out, with a negative result. Picrotoxin was given intravenously in 6 mg. doses until 102 mg. had been given. It was then discontinued because little progress had been made (see figure). Methedrine was given intravenously in 15 mg. doses to maintain the systolic blood-pressure at 100 mm. Hg. Later, 30 mg. was added to 1 pint of intravenous fluid on two occasions. Continuous intravenous infusions were given, alternately of physiological saline solution and of dextrose; the solutions were warmed to approximately the patient's body-temperature. Her trachea and bronchi were cleared by suction every thirty minutes; on each occasion 5–15 ml. of brown offensive secretions was aspirated. Intramuscular penicillin 1,000,000 units was given, followed by 500,000 units eight-hourly. A catheter was passed six-hourly during coma, with little result initially. Intramuscular mersalyl 2 ml. was given to increase the excretion of barbiturate.

Progress.—After fifteen minutes' administration of 10% carbon dioxide in oxygen respiration became regular at a rate of 10 a minute. Forty-five minutes after admission a faint radial pulse was detectable, and the heart-rate had increased to 35 a minute. The circulation improved over the next forty-five minutes, the pulse-rate rising to 50 and the blood-pressure, which was very labile, to 70/40 mm. Hg. Pulse and blood-pressure showed further improvement over the next two hours. Six hours after admission, warmth having been applied throughout this period, a thermometer graduated to a sufficiently low temperature became available. Oral and axillary temperatures of 84·2°F were recorded. Thereafter the axillary temperature rose steadily by about 2°F an hour for the next five hours, and then more slowly until it became normal eighteen hours after admission. With restoration and maintenance of peripheral circulation and respiration the patient's colour and general condition improved, but all her reflexes were still absent four hours after admission. Her pupils did, however, gradually decrease in size and, eight hours after admission, reacted to light, and a corneal reflex was elicited. Three hours later a feeble swallowing reflex was present. When carbon dioxide and oxygen were temporarily withheld, the respirations diminished in depth and then in frequency, and the pupils dilated, with suppression of reaction to light and of the corneal reflex. These changes also took place when 100% oxygen was administered for more than five minutes. The interval during which the patient's respira-



Treatment and progress of a patient with barbiturate coma.

DR. DORMANDY: REFERENCES—*continued*

Lyall, A. (1945) *Glasg. med. J.* **143**, 93.
MacLeod, D. (1950) *In* Modern Trends in Obstetrics and Gynæcology, edited by K. Bowes. London.
Masson, J. C. (1945) *Trans. west. surg. Ass.* **53**, 35.
Mazza, H. L. (1949) *Bol. Soc. Obstet. Ginec. B. Aires*, **28**, 362.
Meyer, R., Kitai, T. (1924) *Zbl. gynäk.* **48**, 2449.
Moss, T. C. (1939) *Amer. J. Clin. Path.* **9**, 345.
Novak, K. E. (1947) Gynæcological and Obstetrical Pathology. Philadelphia.
Polster, K. O. (1926) *Virchows Arch.* **259**, 96.
Pumphrey, K. E. (1937) *Ohio St. med. J.* **33**, 61.
Rubinstein, M. W., Kurzon, R. M. (1952) *Amer. J. Obstet. Gynec.* **63**, 458.
Sampson, J. A. (1925) *Ibid.* **10**, 462.
— (1927) *Amer. J. Path.* **3**, 93.
Sanders, R. L. (1943) *Surgery*, **13**, 224.
Scott, R. B., Te Linde, R. W. (1950) *Amer. J. Surg.* **131**, 697.
Tomkinson, J. S., Winterton, W. R. (1955) *Brit. med. J.* i, 889.

tions were adequate without carbon dioxide and oxygen did, however, increase from 3–5 minutes to 18–20 minutes by the twelfth hour after admission. Thereafter the depth of coma remained constant while supportive measures were continued for a further fourteen hours. Twenty-eight hours after admission bemegride 50 mg. and amiphenazole 15 mg. were administered intravenously, these doses being repeated four times at intervals of five minutes. After the fourth injection the patient began to moan and responded to painful stimuli. A plantar withdrawal reflex indicating lightening coma (Shulman et al. 1955) and tendon-reflexes could be elicited for the first time since admission. During the next two hours unconsciousness deepened. The same dosage of the bemegride and amiphenazole was therefore repeated. A plantar withdrawal reflex returned, together with muscle tone and involuntary movements, after the second injection, and a state of light anæsthesia was attained when the total amount had been given. An hour later consciousness returned, and within two hours the patient could answer questions although she was confused, and she complained of being unable to see. She had been unconscious for about forty-eight hours. That night she remained awake, no sedative being given. Next night she did not sleep despite having gr. $1^1/_2$ each of sodium quinalbarbitone and sodium amylobarbitone. Quinalbarbitone gr. 6 on each of the two succeeding nights produced only a state of drowsiness, and it was not until the fifth night after regaining consciousness that she actually slept. She became rational eighteen hours after consciousness returned; her sight improved rapidly.

Seven hours after admission her right thumb and the radial side of her right hand became swollen, and shortly afterwards blisters formed. Three days later the skin peeled off, and some sensory loss was demonstrated. A retrospective diagnosis of frostbite was made. Full movement and sensation gradually returned over two weeks. Her further progress was uneventful and she made a good recovery.

Comments

This case illustrates the dramatic effect which bemegride and amiphenazole can have on barbiturate coma. Cerebral stimulants and supportive measures had lightened the level of coma slightly for twenty-eight hours—a rate of progress which was in contrast to that produced by bemegride and amiphenazole.

Both oxygen and carbon dioxide were essential before treatment with bemegride and amiphenazole. The effectiveness of carbon dioxide in maintaining the depth and rate of respiration was rather surprising in view of the fact that the respiratory centre's response to stimulation by carbon dioxide is depressed in barbiturate poisoning (Goodman and Gilman 1955).

It is considered that the hypothermia consequent on prolonged exposure (shown by the frostbite) contributed to the patient's survival by lowering cellular metabolism. The small amount of oxygen supplied by the depressed respiratory and circulatory systems was thus able to meet the diminished oxygen requirements of the tissues.

Summary

A case of barbiturate coma complicated by hypothermia is reported.

The effects of cerebral stimulants, of purely supportive measures, and of bemegride and amiphenazole successively in the same patient are described.

Hypothermia is thought to have contributed to this patient's survival.

Our thanks are due to Prof. I. G. W. Hill for permission to publish and for his helpful criticism; and to Dr. W. T. Strauss for guidance in the management of this case.

REFERENCES

Goodman, L. S., Gilman, A. (1955) The Pharmacological Basis of Therapeutics. 2nd ed., London; p. 130.

Locket, S., Angus, J. (1952) *Lancet*, i, 580.

Shulman, A., Shaw, F. H., Cass, N. M., Whyte, H. M. (1955) *Brit. med. J.* i, 1238.

PHENOBARBITONE POISONING TREATED WITH BEMEGRIDE

A. D. F. HURDLE, M.B. Lond., HOUSE-PHYSICIAN
B. K. LANE, M.B. Lond., HOUSE-SURGEON
PADDINGTON GREEN CHILDREN'S HOSPITAL, LONDON

BEMEGRIDE (β-ethyl-β-methylglutarimide, 'Megimide') is said to be of value in the treatment of poisoning by barbiturates (Shaw et al. 1954, Harris 1955, Montuschi and Wickenden 1955, Shulman et al. 1955, Bingle and Whitwam 1955, Webb 1955, Buckman 1955, Holten 1955, Perinpanayagam 1955, Perinpanayagam et al. 1955).

We report here the recovery of a baby from a very large dose of phenobarbitone and comment on the use of bemegride.

Case-report

A boy, aged 14 months, was admitted to hospital on Dec. 18, 1955, in coma. Two days previously his family doctor had prescribed succinylsulphathiazole for a mild gastro-intestinal upset. Shortly after the first dose the child became drowsy, but administration of the medicine was continued, and he received either five or six doses in thirty-six hours. During the two days before admission his drowsiness deepened into coma.

On admission he weighed 26 lb., his temperature was 100°F, pulse-rate 140, and respirations 30 a minute. He was well nourished and rather fat. He was deeply comatose and responded with only a very slight withdrawal movement to painful stimuli, but was breathing quietly and was not cyanosed. His pupils reacted to light and were equal in size. The corneal, gag, swallowing, tendon, and abdominal reflexes were all unobtainable. The plantar responses were flexor. Lumbar puncture showed normal cerebrospinal fluid under a pressure of 240 mm. of water.

Diagnosis.—Phenobarbitone poisoning was diagnosed when analysis by isolation, melting-point, elementary analysis, and ultraviolet spectra of the remainder of the medicine showed it to contain phenobarbitone and no sulphonamide. By this time the child had been in coma for about thirty-six hours. At no time was there evidence of respiratory or circulatory failure. No rash appeared.

Treatment and Progress.—It was decided to treat the child with bemegride because of the long-continued coma and the large amount of phenobarbitone taken (later estimated at gr. 55). A scalp-vein infusion was set up and 25 mg. bemegride injected into the infusion tubing. The child at once stirred and moaned, and his face flushed. Two further injections were given at intervals of five minutes. After the last of these the face again flushed and the pulse-rate quickened from 95 to 120. During one injection the fluid was noticed to be running into the subcutaneous tissues. This caused no apparent local reaction. During the subsequent one hour and forty minutes nine injections of 25 mg. of bemegride were given into the infusion tubing at intervals of five to thirty-four minutes. Three of these were preceded by amiphenazole (2 : 4-diamino-5-phenylthiazole hydrochloride, 'Daptazole') 7·5 mg. At the end of this period the child was crying, had a strong grasp reflex, was moving all limbs, and objected to having his eyelids opened. Depressing his tongue caused "gagging." The later injections caused spasm of the vein next to the needle, making transfusion difficult; so bemegride was mixed with the transfusion fluid in the bottle. The first such bottle contained 500 mg. of bemegride and 400 ml. of 0·18% sodium chloride with 4·3% dextrose. After two hours the child became more deeply comatose, so bemegride 25 mg. preceded by amiphenazole 7·5 mg. was injected into the tubing. The child at once cried and moved his hands. The next transfusion bottle contained 620 ml. of 5% dextrose and 1000 mg. of bemegride. No more amiphenazole was given. The child's condition gradually improved, and on Dec. 20, although he was not fully conscious, his eyes were open and he was reacting vigorously to painful stimuli. The transfusion was stopped. A few hours later he was sitting up and taking notice of his surroundings. He had received 2827 mg. of bemegride in eighty hours. Throughout treatment the pulse-rate was 95–120 and the respirations were 20–25 a minute. Penicillin and streptomycin were given prophylactically. Two

days later, on Dec. 22, the child was discharged home still slightly ataxic but reacting normally to his parents and feeding well.

All the urine was collected from the time of diagnosis—i.e., thirty-six hours after the onset of coma—for seventy-two hours. In the first twenty-four-hour specimen 56 mg. of phenobarbitone was found; in the second 13 mg.; and in the third 10 mg. Metabolites of the drug were not detected.

Follow-up.—Seen on Jan. 2, 1956, the child was well; in fact his parents complained that he was sleeping badly.

Discussion

This child received a large dose of phenobarbitone (about gr. 55 in divided doses in thirty-six hours) and was in coma for at least thirty-six hours before treatment was begun. Since his respiration did not become depressed, he might well have recovered without active treatment.

The fact that he was fat may have been to his advantage. It is known that some of the short-acting barbiturates—e.g., thiopentone—are absorbed from the blood-stream by fatty tissue (Goodman and Gilman 1955). The fact that respiration was not affected in this case suggests that a similar mechanism may apply to phenobarbitone.

The small amounts of phenobarbitone found in the urine can be explained by the lapse of time before collection was begun and the amount which must have been metabolised (Goodman and Gilman 1955).

Unless respiration is depressed, the use of amiphenazole as well as bemegride seems unnecessary, although it has been recommended (Shulman et al. 1955).

Bemegride does not appear to be toxic. The chief danger in its use seems to lie in failing to realise that it may have to be given for a long time. The patient's condition is liable to regress if the dose is reduced prematurely. This was well shown in the present case, where bemegride had to be given for eighty hours. For this reason it seems more sensible to mix it with the intravenous transfusion fluid in the bottle rather than to inject it intermittently.

Summary

A case of phenobarbitone poisoning in a child aged 14 months is reported. Phenobarbitone had been administered for thirty-six hours by mistake for succinylsulphathiazole.

On admission the child was deeply comatose, but his respiration and circulation were not depressed.

He was treated successfully with 2827 mg. of bemegride, mixed with a convenient intravenous transfusion fluid, given continuously for eighty hours.

We wish to thank Dr. T. Stapleton, who was in charge of the case, for advice and encouragement; Prof. A. Neuberger for help in the diagnosis and for the chemical analyses; and Dr. Keith Mant, Dr. T. A. B. Harris, and Dr. T. E. Oppé for advice.

REFERENCES

Bingle, J. P., Whitwam, J. G. (1955) *Brit. med. J.* i, 1340.
Buckman, J. (1955) *Ibid*, ii, 203.
Goodman, L. S., Gilman, A. (1955) The Pharmacological Basis of Therapeutics. London.
Harris, T. A. B. (1955) *Lancet*, i, 181.
Holten, C. (1955) *Ibid*, ii, 619.
Montuschi, E., Wickenden, P. D. (1955) *Ibid*, i, 622.
Perinpanayagam, M. S. (1955) *Ibid*, ii, 620.
— Nicholls, G., Osmond, J. D. (1955) *Brit. med. J.* ii, 912.
Shaw, F. H., Simon, S. E., Cass, N., Shulman, A., Anstee, J. R., Nelson, E. R. (1954) *Nature, Lond.* **174**, 402.
Shulman, A., Shaw, F. H., Cass, N. M., Whyte, H. M. (1955) *Brit. med. J.* i, 1238.
Webb, J. W. S. (1955) *Ibid*, ii, 56.

Medical Societies

BRITISH ORTHOPÆDIC ASSOCIATION

THE association's spring meeting was held at Gleneagles on May 3–5, under the presidency of Mr. PHILIP WILES.

Conservative Treatment of Spinal Tuberculosis

Mr. J. P. JACKSON (Harlow Wood) discussed 89 cases of spinal tuberculosis, reviewed not less than two years after treatment, which had consisted of immobilisation on a frame or plaster bed and streptomycin 1 g. and *p*-aminosalicylic acid 18 g. daily for ninety days. 3 patients had died, all from meningeal or genito-urinary infection. Amyloid disease and sepsis were no longer problems, and sinuses closed more readily, although five had persisted and one new sinus had developed under treatment. Posterior fusion by tibial grafts was usually undertaken when the lesion was quiescent, and of these 36% proceeded to anterior fusion also; anterior fusion had occurred in 46% of cases which had not been operated on but gave no certain guard against relapse, which ensued in 11% of such cases. The relapse-rate after surgery was, however, only half that where no operative fusion had been performed. Abscesses were not opened routinely, but it was found that only 24% of those with persistent abscesses proceeded to bony fusion. Mr. Jackson concluded that general treatment was still necessary; conservative treatment with three months' chemotherapy gave 21% unsatisfactory results, but total duration of treatment was shorter and mortality was reduced. Posterior grafting was well worth while.

Mr. ROBERT ROAF (Liverpool) remarked that chemotherapy is now given usually for nine to twelve months, and that we have learnt how fallacious the interpretation of radiographs can be in assessing quiescence.

V-nail Fixation for Fractured Neck of Femur

Mr. A. W. FOWLER (Bridgend) recommended V-nail fixation for trochanteric and basal fractures of the neck of the femur. This was a modification of the "low nail" operation described by Brittain in 1942. A V-nail (actually a clover-leaf Kuntscher nail with half of the lateral leaves shaved down) provided fixation based on three solid points—the dense bone of the head, the upper end of the medial cortex of the shaft, and the outer cortex at the point of penetration. He permitted weight-bearing after eight weeks, and earlier in stable fractures. This admittedly experimental method was mechanically sound and cheaper and more efficient than pin or bladeplate, and it permitted telescoping when necessary, but not coxa vara.

Mr. G. K. MCKEE (Norwich) had had similar favourable experience of the procedure, but remarked that some apparently pertrochanteric fractures were really subtrochanteric posteriorly, so a nail might split the cortex in this region. He therefore preferred to add to a vertical nail a slotted plate which would allow some telescoping.

Mr. ROLAND BARNES (Glasgow) did not think that this method was adequate for the unstable type of fracture, because the comminution of the inner cortex would preclude stability and permit varus deformity with danger of the nail breaking through the head as in other methods.

Internal Fixation for Bennett's Fractures

Mr. F. C. BADGER (Birmingham) described his method of treating Bennett's fractures, whereby through a dorsal incision the fragment was reduced and fixed by a small screw passed through the base of the shaft. No plaster was necessary. The patients were off work on average for three weeks. In 13 out of 17 cases the results had been good, the failures resulting either from the use of too short a screw with later redisplacement of the fragment, or from a badly placed screw.

Mr. O. J. VAUGHAN-JACKSON said that he used a small pin and a mid-lateral approach; in 2 cases the small fragment had been found turned over so that the articular cartilage was apposed to cancellous bone on the major fragment.

Congenital Dislocation of Hip

Mr. J. C. SCOTT (Oxford) reported the interim results of 75 cases of congenital dislocation of the hip treated at Oxford since 1949, under the régime devised by Mr. E. W. Somerville and himself. The cases were treated within what he called the "critical period"—from the beginning of weight-bearing to the age of 4. The method consisted in (1) gradual reduction by traction on a special frame, (2) operative removal of the limbus where this was shown by the arthrogram to be in-turned, and (3) rotation osteotomy to correct anteversion when required. He believed that the dislocation was first anterior and later became superior and then posterior for the head to lie on the dorsum ilii. He thought that it was usually the lesser trochanter that pushed in the limbus; the secondary reduction in circulation was responsible for the smallness of the epiphysial head and cases of later osteochondritis. The

use of the frame was an essential part of their régime; the head of the femur could always be brought down but was commonly left standing out from the acetabulum. 75 operations had been performed and only once had they failed to find an inverted limbus, which might be very large; the limbus could not be everted. The position of subsequent plaster immobilisation depended on the degree of internal rotation required to reduce the head fully; in 1 case posterior capsulotomy had been needed to permit this. Three weeks later a rotation osteotomy was done, leaving the upper fragment unmoved and rotating the shaft to the neutral position. Five weeks later the patients were left free from splintage and early weight-bearing was permitted. The total duration of treatment had now been reduced to fourteen weeks. Further dislocation had taken place in 3 cases, either because the limbus had not been excised or because derotation had been insufficient and further operation was required. All cases had a range of movement 90% or more of normal.

Slipping of Upper Femoral Epiphysis

Mr. P. H. NEWMAN reported the results of surgical treatment of slipping of the upper femoral epiphysis in 39 cases. The results were excellent in 23, good in 8, fair in none, and poor in 8. If there was less than one-third-diameter posterior and less than one-quarter-diameter medial displacement the femoral head was pinned in situ. Because of the difficulty of insertion into the epiphysis, the danger of damaging its blood-supply, and the possibility of a subtrochanteric fracture at the point of insertion, he had abandoned the use of a Smith-Petersen nail and used a modification of Moore's pins. In this first group only 1 out of 19 had a poor result. If the position was unacceptable an attempt to improve it by very gentle manipulation was made and pins were inserted if adequate reposition was obtained. There were 7 cases in this group; perfect reduction was rarely obtained, but in the single poor result the patient had had a stiff hip before operation. Where closed reduction failed open reduction through an anterior approach, with excision of a wedge of bone where necessary, was performed. A pin inserted up the neck ready before the open correction was done could be driven on immediately the head was reduced, and this prevented loss of position during the later stages of the operation. The results had been poor in 3 out of 9. Treatment of the fourth group was by subtrochanteric osteotomy, which he had now abandoned. Treatment in these cases was urgent. Poor results followed avascular necrosis and operations on hips already stiff from delayed diagnosis or prolonged traction. In such cases two months' physiotherapy to mobilise the hip and improve the local blood-supply was indicated before operation could be considered.

Mr. A. M. RENNIE (Aberdeen) reported his results in 15 cases. Avascular necrosis had developed in 3, and he agreed that operations on stiff hips, which had resulted in 2 poor results in his own series, must be avoided.

Dr. E. THOMASEN (Aarhus) had tried to stimulate fusion by drilling across the epiphysial plate, keeping the patient eight weeks in bed on traction without plaster fixation. Occasionally he had left a Kirschner wire across the plate for a few months as additional fixation. A subcapital wedge osteotomy with drilling and fixation by Kirschner wires was reserved for later cases. Avascular necrosis had developed in 3 out of 14 cases.

Fractured Neck of Femur Treated by Compression

Mr. JOHN CHARNLEY (Manchester) described the treatment of fractures of the neck of the femur by compression. With present methods a third failed to unite within the first year. He had been using a coarse threaded screw in the femoral head; the smooth shaft of this screw passed through a socket inserted into the femoral neck and fixed by a plate to the femoral shaft. A nut and spring allowed compression to 25 lb. The angle was fixed at 120°. Special tools were required, and while all other movements were prevented the spring maintained compression between head and neck should absorption of the latter occur. The apparatus permitted measurement of the degree of shortening taking place in the neck. Cases fell into two groups: one in which extrusion of the bolt was seen to cease after three months; and another in which it continued to progress for a year or more. Of 33 cases available for study 82% united satisfactorily.

Arthrodesis of Hip

Mr. MCKEE reported the results in 50 cases of arthrodesis of the hip by a lag-screw, reviewed at least two years after operation. The operation was done through a lateral approach. After removal of the articular cartilage the hip was fixed by a lag-screw inserted up the femoral neck and into the ilium. The neck was drilled out to allow the smooth shaft of the screw free passage when final compression was applied, and it was important to ensure that all the threaded part was in the ilium. The greater trochanter was removed and used as an iliofemoral graft. In 76% of cases no additional plaster fixation was used. The screw broke in 16%, but in only half of these did it need to be removed: this complication had not occurred in the last 38 cases. There had been 2 deaths, 1 from delayed shock and the other from coronary thrombosis. In only 1 case had union failed to take place, owing to old ischæmic necrosis in the femoral head. Final results showed 34% excellent, 32% good, and 28% fair.

Knock-knee in Children

Mrs. M. MORLEY reported an investigation into knock-knee in children. In general knock-knee became increasingly common and severe up to the age of $3^1/_2$ years, after which it diminished steadily. Sex made no difference to the incidence, but the more severe the knock-knee the greater was the weight of the children. No correlation with height was found, and valgus ankles and flat-feet (the latter almost universal in the very young) diminished with age and were unrelated to knock-knee. She had failed to find any association between knock-knee and the age of first walking, the duration of breast-feeding, additional vitamins, or the length of time spent in bed because of illness.

Paralytic Scoliosis

Mr. J. I. P. JAMES had attempted to correlate the distribution of paralysis with the curve patterns in paralytic scoliosis. Of 193 cases, divided into high thoracic, thoracic, thoracolumbar, lumbar, combined thoracic and lumbar, and "telescopic" spine, he had chosen the high thoracic, thoracolumbar, and lumbar for special study. When the onset was before the age of 5 the curvature usually exceeded 100°, but if delayed till after the age of 10 it was usually less than 70°. The high thoracic curve usually started at T1. In contradistinction to Colonna he had failed to find any correlation between paralysis of the shoulder-girdle or proximal segments of the upper limb in this type of curvature. The erector spinæ was usually normal and there was no significant relationship to abdominal paralyses. He had, however, found almost constant paralysis of the intercostal muscles on the convex side, and in contradistinction to idiopathic curves the ribs were not spread on this side but were crowded and hung almost vertically so that they were obscured by the spine on the anteroposterior radiograph. A ciné-radiographic film showed the ribs on the concave side moving well on respiration in contrast to those on the convex side. In thoracolumbar curves with the apex at D11 or D12, and in lumbar curves, weakness of the lateral flexors on the convex side was constant. Weakness of the erector spinæ, anterior abdominal muscles, psoas, glutei, or lower limbs was apparently unrelated. The only other factor that he believed to be significant was gravity. On the M.R.C. scale adequate muscle charting of the trunk muscles was extremely difficult and of the intercostals obviously impossible by clinical methods.

Fractures and Dislocations of Cervical Spine

Mr. F. C. DURBIN (Exeter) discussed 75 cases of fractures and dislocations of the cervical spine, seen in a ten-year period. 12 of these involved atlas and axis and were excluded from consideration. The rest were chiefly in young active males, road accidents being the commonest cause. Where paralysis was absent and there were other serious injuries, the lesion was easily missed. A fractured spinous process always implied damage to the interspinous ligament. In these injuries, if no dislocation was present he advised that radiographs in flexion carefully controlled by the surgeon should be taken to test the stability of the spine. In over half the cases with dislocation the cord or nerve-roots were injured. In 26 the cord was injured; in 15 there was complete quadriplegia, and 14 of these patients had died. He recommended gradual reduction by skull traction with Crutchfield ice-tong callipers, which were safe and effective if tightened daily. The 4 failures of reduction by this method were due to locked facets, which needed operative reduction. Simple immobilisation after reduction was not sufficient; recurrence of displacement, as shown by radiographs in flexion, had occurred in 8 cases, 3 of them even after six months in plaster, and 2 associated with fractures of a spinous process where

no dislocation was present at first. He therefore recommended open fixation by wiring the spinous processes and bone-grafting in all such cases; wiring alone was insufficient. Union was rapid and protection was required for three months only; there had been no deaths in 16 operations.

Mr. BARNES said that in these cases he applied both deep and superficial wiring to his grafts; this gave such stability that only the lightest collar protection was necessary. He suspected that cases of unilateral locked facets were always irreducible by traction alone and needed immediate open reduction.

Stress Fractures of the Fibula

Mr. M. B. DEVAS, with Mr. R. SWEETNAM, had seen 50 cases of stress fracture of the fibula, all in athletes. All their patients were already in training, and the chief cause appeared to be running on a hard surface. A ten-day history was common, and the usual complaint was of pain behind the ankle. In some cases the onset was sudden; in rather more it was gradual. A few had noticed local swelling; this was always slight, tender, and soft at first and later hard. "Springing" the fibula produced pain. Diagnosis was made on clinical grounds and not from radiographs, in which the changes were slight even after a month. A fine crack appeared, often affecting only the lateral cortex, and running upwards, inwards, and forwards; the periosteal reaction was minimal. The scar in the bone might remain visible for years. The majority (29 cases) occurred between 4 and 7 cm. from the lower end of the bone; the highest seen was 23 cm. up. Two-thirds of the cases had occurred in the winter months, perhaps because at that time official tracks were being saved and training done on roads. They believed that the stress was due to muscle action each time the ball of the foot struck the ground; they demonstrated by special radiographic technique that static contraction of the calf muscles without ankle movement caused the upper two-thirds of the fibula to approximate to the tibia, although the lower part remained unmoved. Patients must stop all sport until free from pain and then take up training gradually. Strapping was useful but plaster was definitely contra-indicated. If pain recurred the patient must again reduce his activities.

Mr. NEWMAN remarked that he had seen cases affecting the upper third of the fibula in parachutists.

Mr. MCKEE had seen 1 case progress to non-union requiring excision and bone-grafting.

Mr. DEVAS thought that the stress fractures of the upper third of the fibula in parachutists were of a different nature and were due to repeated relatively severe injuries.

BRITISH INSTITUTE OF RADIOLOGY

Radioactivity in Man and his Environment

IN a presidential address on June 24, Prof. F. W. SPIERS discussed the background or natural radioactivity of Man and his environment.

Professor Spiers pointed out that Man has always been exposed to ionising radiations: in fact, he has always lived in a radioactive world. It now seems likely that, at least in geologically recent times, there has been no great change in the radiation intensity to which Man has been exposed in his environment. But Man has now begun to produce artificial radioactivity and ionising radiations in abundance, and Professor Spiers considers it possible, and perhaps likely, that the increase in radiation background now taking place will be greater than any changes in the past.

The human body is naturally irradiated in two ways: by sources of radiation external to the body, which include terrestrial and cosmic radioactivity; and by internal radioactivity acquired by the body from air, food, and water. The radiation dose acquired in this way is known as the "background dose."

The main contributors to terrestrial γ-radiation are the members of the uranium and thorium series, together with naturally occurring radioactive potassium. Swedish alum shale is an example of a particularly highly radioactive rock; granites are less active, and sedimentary rocks are considerably less active than granites. Sea water has a low radioactive content; the equivalent radium content of sea water is about 100 times lower than that of sedimentary rocks. High radioactivity can occur in mineral waters and well waters. The radioactivity of tap water is much reduced by precipitation methods of purification.

The natural radioactivity of the air is due to radon and thoron arising from the escape of these gases from the ground. Their local concentrations depend on local atmospheric conditions, as well as wind, rain, dust, and, in the case of buildings, their ventilation and fabric.

The radium content of the human body has lately been established as $0{\cdot}05$–$0{\cdot}32 \times 10^{-9}$ g. Since there is only a slight correlation between the body-radium content and drinking-water, it seems probable that the major source of this radium is food. The other main contribution to internal radiation is from radioactive potassium; the ^{40}K body content is now established at about 0·2% of body-weight. Radioactive carbon as ^{14}C, though present, is such a weak β-ray emitter that its contribution to radiation dose, compared with radium and potassium, is negligible.

There are three components of external radiation background: local γ-radiation, cosmic radiation, and atmospheric radioactivity.

Rock radioactivity is responsible for most of the external γ-radiation background. Higher dose-rates are recorded inside buildings than in the open air, particularly if the building fabric contains a high proportion of radioactive material—for example, alum shale in concrete. In general, wooden houses do not have very dissimilar dose-rates from those in the open air; brick buildings are intermediate between wood and concrete or concrete-shale structures. The dose-rates recorded vary from 48 to 50 m.rad.[1] per year out of doors or in Swedish wooden houses, to 171 m.rad. per year for concrete buildings with a high proportion of alum shale in the concrete.

Cosmic radiation at sea level in Northern latitudes contributes 28 m.rad. per year. This intensity is increased by altitude, and diminished by absorption in the basements of tall buildings.

Atmospheric radioactivity under normal conditions with a radon atmospheric content of 3×10^{-13} curie[2] per litre contributes about 4 m.rad. per year. This is small; but if the highest recorded values from London of 2–3×10^{-12} curie per litre are used, the γ-ray dose is of the same order as that from cosmic radiation.

The internal radiation background is due to radioactive potassium primarily in soft tissues, ingested radium in bone, radioactive carbon, and radon and its disintegration products in air.

^{40}K is the main agent of soft-tissue irradiation and is estimated to contribute 20 m.rad. per year mean dose, the dose-rates to individual organs being determined by their potassium content. ^{14}C contributes about 1 m.rad. per year.

Bone dosage is likely to be particularly heterogeneous, but if 82 m.rem.[3] per year is received from sources other than radium, and if an osteocyte is 5 μ in diameter, the radium contribution is estimated to be 39 m.rem. per year, making a total dose-rate of 121 m.rem. per year to the osteocyte.

The contribution to the internal background radiation made by radon and its daughter products arising from their inhalation is uncertain, and depends on the assumptions made. It is probably of the order of 2·0 m.rem. per

1. rad. is a unit of absorbed dose. It is 100 ergs. per gramme. (International Commission on Radiological Protection 1953.)
2. curie is a unit of radioactivity defined as the quantity of any radioactive nuclide in which the number of disintegrations per second is $3{\cdot}700 \times 10^{10}$. (I.C.R.P. 1955.)
3. rem. is the absorbed dose of any ionising radiation which has the same biological effectiveness as 1 rad. of X-radiation with average specific ionisation of 100 ion pairs per micron of water, in terms of its air equivalent, in the same region. A dose in rems. is equal to the dose in rads. multiplied by the appropriate R.B.E. (relative biological effectiveness). (I.C.R.P. 1955.)

year to soft tissue, from an atmosphere with a radon content of 3×10^{-13} curie per litre of radon. This figure would of course be very much higher, and may be of considerable significance, under higher radioactive atmospheric conditions.

Estimates of total gonad dose-rates vary from 90 m.rad. per year for outdoor workers in Leeds to 146 m.rad. per year for Swedes living in concrete houses.

Estimates of the total lung dose-rate from background sources have also been made. In addition to soft-tissue radiation from "external" background sources and "internal" radiation by ^{40}K, further irradiation will occur as a result of inhaling particulate matter carrying radon and thoron daughter products. The resultant lung dosage from this source will depend upon many variable factors, the chief of which are the solubility of the inhaled material, the size of the inhaled particles, the conditions of inhalation, and the ventilation-rate. High lung-ventilation rates reduce radon and thoron doses by a factor of about 4. In view of the variables involved, a number of assumptions have been made. The total dose-rate to superficial bronchial tissues is about 300 m.rem. per year—three times that calculated for general soft tissue elsewhere in the body.

Lastly, Professor Spiers presented the results of calculations on the quantities of two fission products—cæsium and strontium—which would be required to produce tissue dose-rates equal to those already being received by body-tissues from natural sources. Both cæsium and strontium, which are long-lived, are capable of being taken into the body structure, and at the present time accidental ingestion of radioactive materials must be regarded as at least a possible accompaniment of nuclear-energy development.

Radioactive cæsium (^{137}Cs) may be expected to follow potassium in behaviour and distribution, and it is calculated that a body content or burden of 0·6 microcuries is required to give a soft-tissue dose-rate equal to the background rate of 100 m.rem per year. Radioactive strontium (^{90}Sr) and its daughter yttrium (90) are known to be taken up in bone, and are estimated to require a body burden of 45×10^{-9} curie to give an average dose-rate to osteocytes equal to that from the natural background. The International Commission on Radiological Protection recommend the introduction of a factor of 5 to allow for the fact that strontium concentrations in bone may be five times higher than those observed for radium; if this is the case, a body burden of 9×10^{-9} curie would be the equivalent strontium burden to give a dose-rate to bone equal to the natural background.

Professor Spiers reiterated that the radiation dose-rate from natural sources has been an inevitable accompaniment of Man's life and evolution; and that it must therefore be at least a reasonably tolerable factor in his environment. It follows that in the assessment of "permissible" doses and dose-rates for present and future use the background dose-rate must be considered and compared with radiation dose-rates known to be harmful.

The background dose is small compared with doses known to produce acute radiation effects, and it is likely that genetic and long-term carcinogenic effects are the main considerations. In this context, the background dose-rate to gonads of 0·1 rad. per year or 3 rad. in a generation of 30 years should be compared with the radiation dose-rate required to double the spontaneous human mutation-rate. This dose is uncertain, because the radiosensitivity of human genes is unknown and variable; but the most recent estimate that can be quoted is that of Muller, which suggests that the "doubling dose" is unlikely to be more than 10 times this background dose.

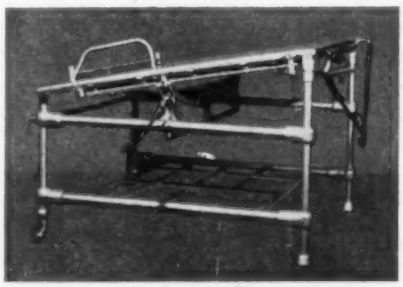
The soft-tissue background dose-rate in bone is estimated at 0·12 rad. per year or about 6 rad. in 50 years. This should be compared with the dose-rate in people with small accidentally acquired radium burdens who show detectable radiographic bone changes, and where the dose-rate is about 2000 times the background dose-rate.

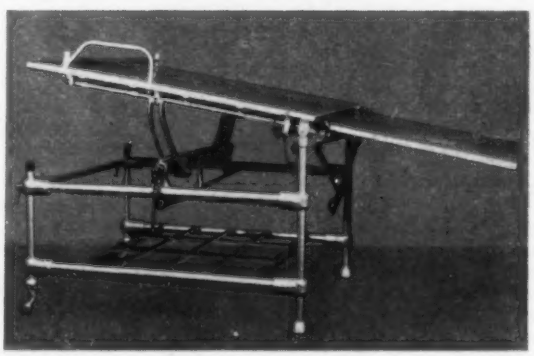
A similar comparison, assuming a normal atmospheric radon content of 3×10^{-13} curie per litre, of the background dose to lungs with the radiation doses causally associated with cancer in soft tissue gives a value 100–1000 times lower for background dose. This background dose of 15 rad. in 50 years (i.e., three times the gonad dose) is probably 10,000 times less than the lung dosages of the Joachimstal uranium miners, in whom the incidence of lung cancer was so high.

New Inventions

MODIFIED "OXFORD" LABOUR-WARD BED

SAFETY in unprepared cases needing a general anæsthetic depends somewhat on the ability of the anæsthetist to posture the patient quickly. Either a head-down or a foot-down position may be desirable. A head-down position will help to prevent aspiration into the lungs should vomiting occur, while a foot-down position may prevent reflux from the œsophagus (or stomach in certain circumstances) before intubation with a cuffed endotracheal tube during application of a muscle-relaxant technique.





In hospital obstetrical practice there are no reasons why special anæsthetic techniques for emergency general surgery should not be used in the labour ward, if they are to the patient's advantage.[1] With this in mind the well-known "Oxford" labour-ward bed has been modified so that it can be quickly tilted into either a head-down or a foot-down position (see figures). The bed can be tilted 20° in either direction in three seconds. This bed has now been in use at St. Thomas's Hospital for just over a year and has proved equally satisfactory to midwives, obstetricians, anæsthetists, and patients. It is made by Hoskins & Sewell Ltd., Bordesley, Birmingham, 12.

W. D. WYLIE
M.A., M.B. Camb.,
M.R.C.P., F.F.A. R.C.S.

St. Thomas's Hospital,
London

1. See *Proc. R. Soc. Med.* 1955, **48**, 1089.

Reviews of Books

Medical History of the Second World War

Royal Naval Medical Services. Vol. II: Operations. Edited by Surgeon Captain J. L. S. COULTER, D.S.C., R.N. H.M. Stationery Office. 1956. Pp. 543. 57*s.* 6*d.*

THIS second volume concludes the official history of the Royal Naval Medical Service in the late war by describing the medical aspects of naval operations. From many thousands of reports the editor has chosen those which illustrate the special problems of war, and has presented them as a clear and orderly account by grouping them into those ashore and those afloat, and by considering each group chronologically and geographically. Occasionally he gives a section to the special matters they illustrate, such as the type of injury caused by different weapons.

The opening chapter deals with the general duties of a ship's surgeon as recorded in a daily journal which covers the commissioning of a cruiser and her service in the Mediterranean and with a Russian convoy during the next eleven months. There follows a detailed consideration of the lessons learned from these experiences, including an excellent commentary on morale. This chapter occupies nearly a fifth of the volume, and provides the first published account of the individual and specialised way of life of the naval surgeon. Even the four pages given to a singularly uninteresting daily sick-list are of value in establishing perspective and balancing the long sequence of epic accounts that follow. Many of these are in the narrators' own words, a few have been skilfully paraphrased, and all are accompanied by shrewd comments or frank and fair criticisms. Brief tables or statistical summaries complete these records.

The difficulty of illustrating such a book has been successfully overcome, but the publisher's lay-out is uneven and only in the last two-thirds of the book are quotations printed in smaller type. The three-page index is inadequate.

Wherever possible, the editor has traced the later hospital history of patients treated in action, showing the value of the simple measures first adopted. These footnotes and statistics represent a formidable amount of research, and Captain Coulter is to be congratulated on maintaining such excellent control over his material, never confusing the main pattern of the book by irrelevant digressions. Stories of extraordinary endurance are inevitably restricted by space: the tented hospital in Crete; the R.N. Hospital, Hong-Kong, during the attack and after the fall; the varied and exciting adventures of the light-hearted and courageous junior M.O. of H.M.S. *Gloucester* at her loss and in his subsequent captivity in Greece and Germany; the affair of the M.O. parachuted into South Serbia and later engaged with the guerillas against the Japanese in the Malayan jungles.

Several passages reveal how the Admiralty's view of security unfortunately excluded ships' surgeons and the medical department itself from taking part in planning—to the Navy's detriment. Thus, the naval surgeons at the Normandy landings were sometimes unaware of what was intended and could make little provision for what was expected of them, while their R.A.M.C. colleagues had been fully briefed. It is, however, reassuring that selected medical officers are now trained in staff duties at Greenwich.

The final impression is of a work well done which successfully achieves the dual aim of a proud record and a reference for the future.

Diseases of the Chest

H. CORWIN HINSHAW, M.D., PH.D., clinical professor of medicine, Stanford University School of Medicine; L. HENRY GARLAND, M.B., B.CH., clinical professor of radiology, Stanford University School of Medicine. Philadelphia and London: W. B. Saunders. 1956. Pp. 727. 105*s.*

THE number of textbooks on diseases of the chest which have appeared in recent years reflects the general activity in this branch of medicine; and this work is a worthy addition to the list. It is intended as a practical, reasonably concise, up-to-date guide for the student and practitioner rather than as an exhaustive treatise; and the authors have, on the whole, succeeded in their aim.

The exposition is clear, the text is amply illustrated with chest films of excellent quality, and there is a good bibliography which concentrates on modern articles of the first importance. A fair balance has generally been maintained in the space allotted to different subjects, but it is surprising that there is no more than a passing reference to influenza; and a less lopsided account of xanthomatosis and "honeycomb lungs" would be an improvement.

Not everyone will agree with the views expressed on some minor points: for example, the pessimistic pronouncement that at bronchography it is a rare feat adequately to fill both bronchial trees at one sitting; or with the opinion that radiotherapy has a place, however small, in the treatment of simple lung abscess.

The book is written by a physician and a radiologist, and the value of such a partnership in chest work is rightly stressed; nevertheless, the importance of the radiologist is harped on so insistently that the reader may recall the celebrated advice, "Codlin's the friend, not Short." In sum, however, this is an excellent textbook which should take its place among the standard works.

New Directions in Psycho-analysis

The Significance of Infant Conflict in the Pattern of Adult Behaviour. Editors: MELANIE KLEIN, PAULA HEIMANN, and R. E. MONEY-KYRLE. London: Tavistock Publications. 1955. Pp. 534. 38*s.*

BITTER controversy about Melanie Klein's theory of early mental development rent psycho-analysis in this country for more than a decade, but it has now abated. As this volume testifies, there is a group of psychoanalysts, composed in about equal proportions of doctors and non-medical members, who accept her teaching and apply it to very diverse problems.

The first part of the book contains twelve essays on schizophrenia, depression, and other clinical subjects; in the second part literary, æsthetic, ethical, and social issues are considered. Some of the writers put forward their views tentatively, others confidently, but it is clear that all are convinced that Mrs. Klein's picture of the "positions" and "defences" of infantile development is correct. There are also two papers by Mrs. Klein herself, one giving the history of her psychoanalytic play technique, the other exemplifying, through a prolonged analysis of a story by Julian Green, her view of projective identification.

In his preface Dr. Ernest Jones says, with repetitive emphasis, that Mrs. Klein's work is firmly established. The book hardly confirms this, but bears out Dr. Brierley's judgment that the series of hypotheses put forward by Mrs. Klein call for lengthy and critical evaluation, rather than outright acceptance or rejection.

The Medical Care of the Aged and Chronically Ill

FREDDY HOMBURGER, M.D., research professor of medicine, Tufts College Medical School. Boston: Little, Brown. London: J. & A. Churchill. 1955. Pp. 253. 42*s.*

Dr. Homburger insists on the importance of preventing the long-term degenerative illnesses which afflict the old. His teaching is directed to the general practitioner, and he deplores the prevalent over-specialisation.

"The splitting of the medical profession into the atoms of specialities has brought great progress and developed supreme skills, but it is time to put the puzzle together once more, for the emergence of the supra specialist, the competent practitioner who can treat and likes to treat the patient as a whole and not merely as so many cases of this or that."

His advice on the diagnosis and treatment of the rather intangible maladies of old age is detailed and sound. The chapters on senile osteoporosis and malnutrition, for example, are excellent. Of inoperable cancer he writes: "it is therefore extremely poor medicine to adopt a completely fatalistic attitude upon the discovery of neoplastic metastases, and to give up in despair." And he gives many examples of ways in which the life of such a patient can be made tolerable. He is convinced of the value of daily exercises for all chronically ill patients. He deplores the use of the bedpan while a

commode is still a practical possibility—"the worst enemy of patient morale is the bedpan."

This is a useful, short, practical book. It must be one of the few medical textbooks to be enlivened by drawings from the pen of as great an artist as the late Raoul Duffy.

Éléments d'immunologie générale

P. GASTINEL, professeur à la Faculté de Médecine de Paris; R. FASQUELLE, agrégé de bactériologie à la Faculté; P. BARBIER, chef de travaux de bactériologie à la Faculté. Paris: Masson. 1955. Pp. 335. Fr. 2000.

THE authors' aim is to cover the syllabus of French diplomas in immunoserology and to give an introduction to research-workers. The treatment is rather uneven and it is not clear what knowledge is assumed in the reader. For example, a few lines are devoted to the elementary chemistry and physics of amino-acids and proteins. This is superfluous for those who have reached 2nd M.B. standard and inadequate for those who have not. The development of ideas of immunity does not seem suitable for those unfamiliar with the subject, and the information about special aspects of immunology is at the same time too detailed for elementary students requiring a general survey, yet too fragmentary for the advanced worker.

The Lacrimal System

Clinical Application. EVERETT R. VEIRS, M.D., professor of ophthalmology, University of Texas Postgraduate School of Medicine. New York and London: Grune & Stratton. 1955. Pp. 156. $7.50.

As Dr. Veirs points out in a preface, many papers have been published on various aspects of the lacrimal apparatus, but none has so far covered the entire field. He has made this interesting and well-arranged monograph as comprehensive as possible and he has written at length and in detail about the clinical features, methods of investigation, and conservative and surgical treatments of disorders of the lacrimal system.

The work is admirably illustrated by photographs and clear pen-and-wash drawings. There is a useful bibliography at the end of each of the twelve chapters. Dr. J. V. Cassady contributed the chapter on developmental anatomy. Several techniques of performing dacryocystorhinostomy by the intranasal route are excellently described.

Perhaps after the description of Summerskill's polythene intubation of a dacryocystorhinostomy and of permanent intubation of the naso-lacrimal duct, some comment should have been made about the failures and serious complications of these techniques. In the full description of the dacryocystorhinostomy operation the author has omitted to mention that the bony fenestration in the lacrimal fossa may be achieved very well, and without damage, either to the nasal mucosa or the lacrimal sac, by using Traquair's elevator, Citelli's punch, and then Ferris Smith's nibblers. There is also no reference to the value of Stryker's electric saw trephine.

The book is well produced and will appeal not only to the eye surgeon but to the rhinologist and pædiatrician.

The Pediatric Years

LOUIS SPEKTER, M.D., director, bureau of maternal and child hygiene, Connecticut State Department of Health. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1955. Pp. 734. 90*s*.

THE aim of this book is to provide an understanding of the child in health and sickness for those working with doctors in a pædiatric service. It is written for the American worker, and much of it reflects the views of that continent both in practice and education. Comprehensive and up to date, it achieves the rare feat of making the pathology of children's diseases understandable to those without basic medical training.

The British medical auxiliary will value highly the digest of children's diseases and the chapters on development, hospital care, and pædiatric procedures. The chapters on the range and scope of the social services will appeal to those interested in methods of solving social and medical problems in the non-welfare State. More might usefully have been said about parents, whose attitudes exert such a profound influence for good or ill, and to whom much of the advice in this book will be passed on.

Few teachers of students, nurses, almoners, and other medical workers would not be glad of the help this book can give.

Laboratory Control of Dairy Plant

J. G. DAVIS, D.SC., PH.D., F.R.I.C. London: Dairy Industries Ltd. 1956. Pp. 395.

THE dairy industry is exceptional in the use which it makes of chemistry and bacteriology in its daily practice. No other branch of the food trade is so "laboratory-minded" or offers so much responsibility to those with a scientific training. Among these, few are better qualified to write this book than Dr. Davis. It is a working manual for manager and technician which covers all the details of day-to-day control without losing sight of the principles upon which these are based. Nowadays the technicalities of the milk trade seldom trouble the medical officer of health but, when they do, it would be difficult to recommend a source of information so lucid, so succinct, and so well indexed.

Functional Otology

The Practice of Audiology. MORRIS F. HELLER, M.D., chief, audiology clinic, Mount Sinai Hospital, New York. New York: Springer. London: Interscience Publishers. 1955. Pp. 209. 40*s*.

IT is immediately clear to the reader that Dr. Heller's experience in audiology is unusually broad. He goes into considerable detail about the staff, equipment, and administration of an audiology centre and deals quite fully with all those important borderline aspects of his subject that are so often lacking or inadequate in a textbook of otolaryngology. There is a useful chapter on "non-organic deafness" and a helpful and timely description of the transistor hearing-aid. Some discussion of the medical and surgical aspects of deafness would have been welcome; but nevertheless the book provides valuable supplementary reading to the otologist who has a particular interest in the problems of deafness.

The Chemical Constitution of Natural Fats (3rd ed. London: Chapman & Hall. 1956. Pp. 664. 95*s*.).—With the present great interest in the physiology of fats and their possible rôles in disease, the new edition of this standard work by Prof. T. P. Hilditch, F.R.S., comes opportunely. It gives the details of the chemical constitution of both animal and vegetable fats from a great variety of species, set out clearly but with encyclopædic thoroughness. A feature of the book is the separate indexes for individual fats and waxes, individual fatty acids, individual glycerides, and of plant families. There is also a valuable chapter on analytical methods. The only criticism is that Professor Hilditch has confined himself strictly to the letter of his title and so there is no reference to margarines and other processed fats which feature in human diet. The information collected in this book is nowhere else so readily available and will continue to be of great value to biologists and medical research-workers.

The Back and its Disk Syndromes (2nd ed. Philadelphia: Lea & Febiger. London: Henry Kimpton. 1955. Pp. 942. £6 15*s*.).—"The foundation of this book is the close personal experience with over 40,000 'back cases.'" This seems a prodigious experience, and if Prof. Philip Lewin has applied to each patient all the clinical tests he describes, it is hard to understand how he has managed to find time to write similar books on the foot and on the knee. Hardly anything has been left out, and the effort to include everything has made an indigestible book. The familiar is intermingled with the erudite, and the inexperienced reader will find difficulty in gleaning an orderly scheme of treatment for any individual case. The diagrams are clear and helpful and the general production of high quality. Many of the author's pithy remarks are admirably suited to stick in the student's memory. The book is a further monument to Dr. Lewin's industry and learning.

SERENITY in the menopause . . .

The menopause is a normal milestone in life, yet it is often accompanied by emotional disturbances with increased tendency to irritability and to disturbed harmony with friends and family.

MIXOGEN tablets, by correcting endocrine imbalance, give rapid relief in the simplest and most economic way.

MIXOGEN

OESTROGEN-ANDROGEN SYNERGY

Literature and sample on request.

dosage : 1-2 tablets daily, reducing when possible.

Each tablet contains 0.0044 mg. of crystalline ethinyloestradiol B.P. and 3.6 mg. of crystalline methyltestosterone B.P. Tubes of 25 and bottles of 100.

ORGANON LABORATORIES LIMITED

BRETTENHAM HOUSE · LANCASTER PLACE · LONDON · W.C.2

Telephone : TEMple Bar 6785/6/7, 0251/2. Telegrams : Menformon, Rand, London.

Spreading smooth and even . . .

Smoothly, thinly and painlessly Ef-Cortelan Skin Lotion (hydrocortisone Glaxo) spreads over tender surfaces. Swiftly, safely, effectively—sometimes in a few hours—it suppresses inflammation, exudation and allergic skin reactions.

A little goes a long way.

Most conditions are adequately controlled by the 0.5% Ef-Cortelan Lotion and, because it has superior spreading and penetrating qualities and brings hydrocortisone into more intimate contact with the tissues, the lower strength is as effective as a 1% ointment. This, and the fact that only a little of the lotion is used, offers appreciable economic advantages. Ef-Cortelan Lotion is especially suitable for extensive, weeping surfaces and for application to the scalp.

GLAXO EF-CORTELAN SKIN LOTION

(0.5% and 1% hydrocortisone alcohol in water-miscible base) in 20 cc. squeeze bottles.

ALSO FROM THE GLAXO CORTISONE RANGE. EF-CORTELAN SKIN OINTMENT NO. 1 (1% and 2½% hydrocortisone acetate in *non-greasy* base); EF-CORTELAN SKIN OINTMENT NO. 2 (1% and 2½% hydrocortisone acetate in *greasy* base). Both in 5 g. and 15 g. tubes; 50 g. jars.

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX BYRon 3434

THE LANCET
LONDON: SATURDAY, JUNE 2, 1956

"Anæmia" in Pregnancy

IN a recent issue Dr. EDGAR and Dr. RICE [1] raised the question whether it is desirable to give iron supplements to *all* pregnant women. They showed, once again, how the hæmoglobin level in the peripheral blood falls during pregnancy; the mean hæmoglobin in their patients when the pregnancy was 5–8 weeks advanced was 91·8%, and at 33–36 weeks it was 76·7%. At the 5–8-week stage only 0·7% of the women had a hæmoglobin level of less than 70% (10 g. per 100 ml.). In their patients the mean corpuscular hæmoglobin concentration (M.C.H.C.)—a measure of iron deficiency—was 30·2%, a figure indicating, according to DISCOMBE, iron deficiency short of anæmia. EDGAR and RICE gave a daily supplement of iron in the form of tab. ferri sulph. co. gr. 9 (0·6 g.) daily; since the familiar green tablets have so often caused nausea or vomiting, they used white-coated tablets and only 5% of their patients reported intolerance. This dose of iron was given to a group of pregnant women of whom 89 were carefully followed through pregnancy. In 69 a normal hæmoglobin level was maintained throughout and the M.C.H.C. remained normal too; in the remaining 20 there were various degrees of falling away from normal.

The gradual fall of the hæmoglobin level in the peripheral blood in pregnancy has long been attributed to an increase in the plasma-volume, and the lowered hæmoglobin level was thus thought to be due to dilution rather than to anæmia. The calculation of the blood-volume has, in most investigations, been made indirectly from the venous hæmatocrit value and the estimation of plasma-volume by the Evans-blue dilution technique. But VEREL et al.,[2] who have reinvestigated this question, point out that the calculation depends on the assumption that the venous hæmatocrit bears a constant relation to the body hæmatocrit. In health the two figures are almost identical, but in disease and in pregnancy this is not necessarily the case. They therefore made simultaneous estimations of the plasma-volume, by the usual Evans-blue method, and the red-cell volume, using radioactive phosphorus (^{32}P). They found that in pregnancy the ratio of body hæmatocrit to venous hæmatocrit varied unpredictably, and consequently it was necessary to re-examine the question of blood changes in pregnancy using separate estimations of red-cell and plasma volumes. Fortunately the new results do confirm previous views. Comparison with measurements made on a series of non-pregnant women showed that, when properly related to body-weight, the plasma-volume increased during pregnancy, and in addition the red-cell volume was maintained or even increased in 2 out of their 13 subjects. This maintenance or rise of the red-cell volume during pregnancy has received less attention than the dilution effect of the bigger increases of plasma-volume, but it has been recognised for some time. CATON et al.[3] found a definite rise in red-cell volume in their series of patients, though there was much individual variation. WILSON and BOYLE [4] pointed out that the red-cell mass was increased in all their 5 patients, but the rise was proportionately not as large as that of the plasma-volume.

All these data suggest that the gradual lowering of the hæmoglobin level in the peripheral blood to about 10 g. per 100 ml. during pregnancy cannot be properly classified as "anæmia," if anæmia means that there is insufficient hæmoglobin to carry the oxygen the patient needs; for it is clear that the red-cell mass is either unaffected or actually increased. Clinical observation had, in fact, led to much the same conclusion; and many obstetricians consider as "anæmic" only those pregnant women whose hæmoglobin is less than 10 g. per 100 ml. (70%). With this definition, other observers have recorded figures very like those of EDGAR and RICE. For example, GATENBY and LILLIE,[5] in Dublin, found 24% of their pregnant patients to be anæmic by this criterion, and 9% of them were below 9 g. per 100 ml.; they noted too that symptoms attributable to the anæmia rarely become prominent at hæmoglobin levels above 6 g. per 100 ml. (45%). EDGAR and RICE have therefore suggested that all pregnant women should have two hæmoglobin estimations, one when they first come to the antenatal clinic and the second between the 32nd and 36th weeks. Those with a hæmoglobin level of at least 70% are given a small dose of iron (gr. 9 of ferrous sulphate daily) to take throughout the pregnancy, but no further investigation is made. Those whose hæmoglobin level is less than 70% are sent for proper hæmatological investigation.

The form of this proper investigation is now established. Owing to the changes in the relations between plasma-volume and red-cell mass the colour-index is useless for diagnosis. We rely on the M.C.H.C. for the detection of iron deficiency and on sternal-marrow examination for the detection of the megaloblastic anæmia of pregnancy. Probably 9 out of every 10 patients with anæmia of pregnancy in this country are iron-deficient. A fair proportion of these will respond quite satisfactorily to oral iron, and, as O'SULLIVAN et al.[6] pointed out, moderate doses of ferrous sulphate or ferrous gluconate will suffice. Increasing the dose beyond 0·6 g. daily of ferrous sulphate or 2 g. daily of ferrous gluconate brings proportionately much less benefit at the cost of a steeply rising intolerance-rate. It is better, in patients not responding to these doses of oral iron, to give parenteral iron, and, now that reliable intravenous and intramuscular preparations are available, such treatment should present no difficulties. But parenteral iron needs time to become effective; about 2 weeks elapse by either route before there is

1. Edgar, W., Rice, H. M. *Lancet*, May 5, 1956, p. 599.
2. Verel, D., Bury, J. D., Hope, A. *Clin. Sci.* 1956, **15**, 1.
3. Caton, W. L., Roby, C. C., Reid, D. E., Caswell, R., Maletskos, C. J., Fluharty, R. G., Gibson, J. G. *Amer. J. Obstet. Gynec.* 1951, **61**, 1207.
4. Wilson, S. J., Boyle, P. *Arch. intern. Med.* 1952, **90**, 602.
5. Gatenby, P. B. B., Lillie, E. W. *Lancet*, 1955, i, 740.
6. O'Sullivan, D. J., Higgins, P. G., Wilkinson, J. F. *Ibid*, 1955, ii, 482.

a satisfactory rise in hæmoglobin. It is for this reason that we wonder whether it would not be better to have the second blood examination earlier—say, between the 28th and 32nd weeks. If patients with anæmia of pregnancy fail to respond properly to parenteral iron, they have almost certainly a megaloblastic anæmia. ISRAËLS and DA CUNHA [7] stated that the only certain method of establishing the diagnosis was by examination of the bone-marrow, and they pointed out that the investigator must look for transitional megaloblasts and giant metamyelocytes, and not rely on finding classically developed megaloblasts. These findings have been confirmed by LOWENSTEIN et al.,[8] working in Canada, and by many others. The Canadian group found that there is nearly always an iron-deficiency anæmia as well, and that the response to therapy is often slower than that in addisonian pernicious anæmia. They found that 4 of their 18 patients responded to treatment with vitamin B_{12}, but most reports from temperate climates state that patients are resistant to B_{12} and the proper treatment is folic acid (15–20 mg. daily, orally or parenterally).

The more controversial part of EDGAR and RICE'S recommendations is that iron should be given to all pregnant women, so that all of them go through pregnancy with a hæmoglobin level of 90% or so. FISHER and BIGGS [9] gave iron supplements to 104 mothers and all but 12 had hæmoglobin levels of 90% at term, and there is little doubt, as JENNISON and ELLIS [10] pointed out, that by using parenteral iron most of the non-responders could have their hæmoglobin levels similarly raised at term. What is not clear is whether it is really beneficial for the mother to have a higher hæmoglobin at term than in the normal course of events. We have seen that the red-cell mass is not decreased in a normal pregnancy; presumably (though we have no data) if the hæmoglobin level at term is 90% instead of 75% of normal, the red-cell mass will be notably increased; is this helpful? FISHER and BIGGS promised their patients that they would be "fighting fit" for labour and for the duties of the puerperium, but all they tell us is that they "gathered the impression" that the patients were more energetic. There is now no doubt that anæmia of pregnancy can be prevented if the patients will attend their antenatal clinics or see their own doctors in time, and if anæmia develops it can be efficiently treated. But we should not lose sight of the other factors in nutrition; iron is only one factor, and the ideal of "a quart of milk, 4 oz. of meat, and one egg" daily, in addition to any iron supplement, should still be aimed at.

Upper Respiratory Virus Infections

VIRUS infections of the upper respiratory tract probably form the largest group of illnesses encountered in general medical practice. When the common colds and virus influenzas are subtracted from the total, there remain a large number of infections which are variously diagnosed as pharyngitis, laryngitis, tracheitis, bronchitis, &c.—that is, names which describe the site at which symptoms and signs are most prominent. It is well known, however,[1] that different viruses can produce illnesses which are clinically indistinguishable, and conversely that a single agent, the influenza virus, may produce a very variable clinical picture in different individuals. Laboratory research on this subject is therefore very welcome, and an excellent review [2] of recent papers has come from DINGLE and FELLER.

We are learning rapidly about the part played by a new group of viruses in infections of the upper respiratory tract, but, surprisingly, one of the difficulties that plagues everyone who writes or talks about these viruses is what to call them. ROWE et al.[3] described the first isolation of the new viruses—from adenoidal tissue removed at operation from children. Since these viruses caused degeneration of adenoidal cells in tissue-culture, they were called adenoidal degeneration (AD) viruses. Shortly afterwards HILLEMAN and WERNER [4] recovered a serologically related agent from an outbreak of upper respiratory disease in a military camp, and called their virus RI-67. HUEBNER and his co-workers [5] have now isolated as many as 11 distinct immunological types of virus from man, of which type 3 has been related to outbreaks of non-bacterial pharyngitis,[6] types 4 (i.e., RI-67 virus) and 7 have been related to outbreaks of acute respiratory disease in recruits,[2] and type 8 may be implicated in the ætiology of epidemic keratoconjunctivitis.[5 7] HUEBNER et al.[6] proposed to call the group of viruses the adenoidal-pharyngeal-conjunctival (A.P.C.) viruses; but DINGLE and FELLER [2] prefer to call them the viruses of acute respiratory disease (A.R.D. viruses), and HILLEMAN et al. describe them as the RI group of viruses. At a recent meeting one virologist suggested that to commemorate the work of HUEBNER, DINGLE, and HILLEMAN, the group should be called the Hudihi or Hidihu viruses—a suggestion which could hardly increase the present state of confusion. Since we have earlier used the name A.P.C.,[8] we shall retain it for the time being.

Types 4 and 7 of the A.P.C. viruses have now been clearly associated with what STUART-HARRIS et al.[1] called "febrile catarrh" and what was subsequently called acute respiratory disease (A.R.D.).[9] This is an acute respiratory infection which characteristically occurs in epidemics among military recruits but not in seasoned men. ANDREWS et al.[9A] found little evidence of A.P.C. infection in 10 R.A.F. stations which did not receive recruits. The illness is an acute, febrile, influenza-like infection in which constitutional upset is usually less prominent and sore throat, hoarseness, and cough are more noticeable than in influenza. Among the physical signs, injection of the pharynx and slight enlargement of the cervical lymph-glands are common. There are a number of mysteries in the epidemiology of this infection. Its association with recruits suggests that it produces much more immunity than does virus influenza, which attacks recruits and seasoned men

1. Stuart-Harris, C. H., Andrewes, C. H., Smith, W. *Spec. Rep. Ser. med. Res. Coun., Lond.* 1938, no. 228.
2. Dingle, J. H., Feller, A. E. *New Engl. J. Med.* 1956, **254**, 465.
3. Rowe, W. P., Huebner, R. J., Gilmore, L. K., Parrott, R. H., Ward, T. G. *Proc. Soc. exp. Biol., N.Y.* 1953, **84**, 570.
4. Hilleman, M. R., Werner, J. H. *Ibid*, 1954, **85**, 183.
5. Rowe, W. P., Hartley, J. W., Huebner, R. J. *Ibid*, 1956, **91**, 260.
6. Huebner, R. J., Rowe, W. P., Ward, T. G., Parrott, R. H., Bell, J. A. *New Engl. J. Med.* 1954, **251**, 1077.
7. Jawetz, E., Kimura, S., Nicholas, A. N., Thygeson, P., Harma, L. *Science*, 1955, **122**, 1190.
8. *Lancet*, 1955, i, 289.
9. U.S. Army Commission on Acute Respiratory Disease. *Amer. J. publ. Hlth*, 1944, **34**, 347.

9A. Andrews, B. E., McDonald, J. C., Thorburn, W. B., Wilson, J. S. *Brit. med. J.* May 26, 1956, p. 1203.

7. Israëls, M. C. G., Da Cunha, F. A. L. *Ibid*, 1952, ii, 214.
8. Lowenstein, L., Pick, C., Philpott, N. *Amer. J. Obstet. Gynec.* 1955, **70**, 1309.
9. Fisher, M., Biggs, R. *Brit. med. J.* 1955, i, 385.
10. Jennison, R. F., Ellis, H. R. *Lancet*, 1954, ii, 1245.

alike. Yet it is not clear why the recruit population should not have already acquired immunity to the virus, nor is it known why epidemics have not been discovered among the civilian population. Furthermore, DINGLE and FELLER [2] point out that although clinically similar syndromes among recruits and seasoned men are extremely common, the large majority are not caused by influenza or A.P.C. viruses. There is clearly a great deal of combined clinical and laboratory investigation still required in this field.

On the other hand, investigation of the cause of non-streptococcal "summer sore throats" has shown the rôle of at least three different viruses, which may well account for a large proportion of these conditions. Herpes-simplex virus causes herpetic stomatitis, some of the group-A Coxsackie viruses have been identified by HUEBNER and his colleagues as the cause of herpangina,[10] and now this same group of workers have found that type-3 A.P.C. virus is the cause of what they call "pharyngo-conjunctival fever."[6] This is an acute febrile illness, occurring particularly in children, in whom pharyngitis, occasional rhinitis, conjunctivitis (often unilateral), and cervical lymph-gland enlargement are the main features. Nowadays the interval between the discovery of a virus and the production of a vaccine against it grows steadily less, and although a good deal remains unknown about the disease-producing powers of the A.P.C. viruses, it is encouraging to know that whatever disease emerges from this jungle of viruses there will almost certainly be a vaccine waiting to meet it. HUEBNER et al.[11] have prepared a vaccine from inactivated type-3 A.P.C. virus and injected it into human volunteers. The volunteers and uninoculated controls were challenged by inoculating live virus on to their conjunctivæ. An illness similar to the natural infection was produced in some of the volunteers and in a significantly smaller proportion of the vaccinated individuals. So far, there have unfortunately been no confirmed reports of how to grow the common-cold virus, or even how to make an efficient common-cold vaccine.

Fort mit dem Spray!

"In the year of our Lord 1536, Francis, the French King, sent a puissant army beyond the Alps. In the conflict there were many wounded on both sides with all sort of weapons, but chiefly with bullets. I will tell the truth," PARÉ continues, "I was not very expert at that time in matters of Chirurgie. . . . I observed and saw that all the Chirurgions used that method of dressing which Vigo prescribes: that they filled, as full as they could, the wounds made by gunshot with tents and pledgets dipped in scalding oyle at the first dressing. . . ." [12] And as befits the neophyte—for he was 27 and this was his first campaign—he followed their example assiduously. Then came his discovery:

"I chanced on a time when, by reason of the multitude that were hurt, I wanted this oyle. Now because there were some few left to be dressed, I was forced—so that I might seem to want nothing, and that I might not leave them undressed—to apply a digestive made of the yolk of egg, oyle of roses and turpentine. I could not sleep all that night, for I was troubled in minde; and I feared that the next day I should find those whom I had not dressed with the scalding oyle dead, or at the point of death, by the poison of the wound. Therefore, I rose early in the morning; I visited my patients, and, beyond expectation, I found such as I had dressed with the digestive only free from vehemence of paine; but on the contrary the others that were burnt with the scalding oyle feverish and tormented; and the parts around their wounds were swolne."

No thunder, lightning, or other heavenly sign proclaimed to the world that the surgical Middle Ages had come to an end. The world remained intensely preoccupied with the petty squabbles of FRANCIS the French King and CHARLES the Emperor, while PARÉ jotted down the immortal summary, "Je l'ai pansay, Dieu le guérit."

But PARÉ was not the first to revolt against the use of scalding oil and cauteries as a means of wound dressing. Over two hundred years earlier HENRI DE MONDEVILLE had written:

"Wash the wounds scrupulously from all foreign matter, use no probes, no tents, except under special conditions; apply no oils or irritating matters. When your dressings have been carefully made, do not interfere with them for several days. Do not pull your dressings about; Nature works better alone." [13]

More than a thousand years before him the physicians of Cos advocated not only gentle irrigation of wounds, to obtain primary healing, but also the careful cleansing of hands—and especially the nails—before operating. And (amid much cant and superstition) the compilers of the Ebers papyrus recorded, in 1500 B.C., that their treatment of wounds consisted in simple apposition of the edges by linen bandage, held in place for three to four days by myrrh and honey.[14] Indeed, the closer we look at medical history, the more we recognise the truth in old Sir "Paddy" Cullen's mockery: "Modern science is a wonderful thing. Look at your great discovery! Look at all the great discoveries! Where are they leading to? Why, right back to my poor dear old father's ideas and discoveries. He's been dead now over forty years."

The other day we discussed experiments by PALUMBO et al.[15] from which they conclude that clean surgical incisions heal as well without dressings as with them. These observations recall some described forty-four years earlier by WEBB-JOHNSON [16] in the *Archives of the Middlesex Hospital*:

"I have felt for some time that the careful application of layer after layer of dressings to closely sutured operation wounds was possibly an unnecessary waste of time, energy and material. An article by Mr. Reginald Alcock [17] on 'Iodine as the sole dressing of Operation Wounds' . . . therefore naturally aroused my interest. His results were so good that I felt not only justified, but encouraged in giving the method a trial. . . . Not only has apparently unnecessary trouble been saved, but the patients have expressed themselves as being most comfortable. One or two patients who had undergone operations before and had experienced the discomfort of dressings and bandages were very pleased to be without these encumbrances. I consider that the wounds healed even better than when dressings are employed, and in no case in which I used the method did the slightest inflammatory reaction occur."

10. Huebner, R. J., Cole, R. M., Beeman, E. A., Bell, J. A., Peers, J. H. *J. Amer. med. Ass.* 1951, **145**, 628.
11. Huebner, R. J., Bell, J. A., Rowe, W. P., Ward, T. G., Suskind, R. G., Hartley, J. W., Paffenbarger, R. S. *Ibid*, 1955, **159**, 986.
12. The Workes of that Famous Chirurgion, Ambrose Parey, translated by Th. Johnson. London, 1634.
13. Chirurgie de Maître Henri de Mondeville, chirurgien de Philippe le Bel, roi de France, composée de 1306 à 1320. Translated into French by E. Nicaise. Paris, 1893.
14. Garrison, F. H. History of Medicine. Philadelphia, 1921.
15. *Lancet*, April 14, 1956, p. 430.
16. Webb-Johnson, A. E. *Arch. Middx Hosp. clin. ser.* 1912, **28**, 11.
17. Alcock, R. *Brit. med. J.* 1912, i, 430.

In the same year DALTON [18] and MADDER [19] gave the method a trial, with equally gratifying results, and BLAND-SUTTON followed WEBB-JOHNSON immediately.

Whatever the reason for the leaps and jumps by which surgery advances (surgical fashion being no more suited to reasoned analysis than the changing fashion in hats and politics), they prove at least the need for periodical re-examination of the practices on which we rely. The no-dressing technique merits re-examination, not only because some of the arguments in its favour may be even more valid today than they were in the past, but because the success recorded by WEBB-JOHNSON and others casts unexpected light on the uncommonness of wound infection in clean surgical incisions forty-four years ago. Though no comparable figures are available, its prevalence is almost certainly much higher today.

FRANK MELENEY [20] says that "if we were to ask the average surgeon how often his clean wounds become infected, he would probably answer, 'Very seldom, not once in a hundred times,' or 'I haven't had an infection for years.' . . . In actual fact, the number will vary from 5 to 20 per cent, or more, of all clean cases. Of those 1 to 5 per cent will be serious, resulting in pain, fever, suppuration, weakness of the wound, disruption or hernia, prolonged hospitalisation and occasionally death." (One must include here fatal complications of antibiotic treatment.) "The others may be called trivial, but they are annoying to the patient and usually delay his departure from the hospital. In the average case of infection the patient must remain in hospital just twice as long as the patient in whom infection does not occur."

If indeed more operation wounds become infected today than forty years ago, the explanation is not far to seek. In 1912 wound infection meant a major disaster: at best it delayed the patient's convalescence by weeks or months; at worst it killed him. Today, on the other hand, if sterile technique falls short of the highest standard, there is a strong temptation to say: "What does it matter? A few pricks—or the latest fashionable 'mycin'—will take care of that." It all sounds very simple; yet LOWBURY [21] was right when he remarked that the "dilemma of hospital infection has been complicated rather than solved by chemotherapy."

In their investigation in a thoracic surgical unit in the North of England, BLOWERS et al.[22] were impressed by the fact that, far from diminishing the incidence of wound-infection, the routine use of "penicillin-cover" merely increased the number of resistant organisms, and thus made the management of cases more difficult. Furthermore, they found that most of the wound-infections originated in the theatre at the time of the operation—the chief reasons for infection being inefficient ventilation, the use of blankets in the theatre, and excessive movement by the staff.

It should be unnecessary in 1956 to point to the advantages of asepsis over antisepsis. All the minutiæ of its technique have been worked out over the past fifty years—the autoclaving of instruments, the scrubbing of hands, the masking of noses, the preparation of operation fields, the avoidance of contamination by air currents, the use of silk and nylon, the gentle handling of tissues, the careful hæmostasis. Nevertheless, at a time when all these precautions should bring the incidence of wound infection in clean surgical fields to less than 1–2%, antisepsis—euphemistically labelled "prophylactic antibiotic cover"—is creeping back into our practice. Antibiotics have become heirs of the carbolic spray; and as they multiply in number and broaden their spectra, the scrubbing-up time shortens, the theatre door slams, the anæsthetist rattles his newspaper, student nurses wander about in aimless bewilderment, and sister absentmindedly adjusts her mask on her nose. Unless we recognise that the defences of this revived antisepsis are already breaking down—and COLEBROOK [23] can see no sign that we do—a time may come when we run out of comparatively harmless drugs to counter sepsis, but have forgotten the routine that prevents it. We shall then need all too plainly a new VON BRUNN to inaugurate a "new" era with the contemporary version of the Teutonic thunder, *Fort mit dem Spray!*

18. Dalton, F. J. A. *Ibid*, 1912, ii, 765.
19. Madder, F. C. *Ibid*, p. 765.
20. Meleney, F. L. *In* Christopher's Textbook of Surgery, edited by Loyal Davis. Philadelphia, 1956.
21. Lowbury, E. J. L. *Brit. med. J.* 1955, i, 985.
22. Blowers, R., Mason, G. A., Wallace, K. R., Walton, M. *Lancet*, 1955, ii, 786.
23. Colebrook, L. *Ibid*, p. 885.
24. Padget, P., Moore, J. E. *Amer. Heart J.* 1935, **10**, 1017.
25. Grant, R. T. *Heart*, 1933, **16**, 275.
26. Moore, J. E. *Amer. J. Syph.* 1949, **33**, 43.
27. O'Brien, J. F., Smith, C. A., Fisherkeller, M. A. *Brit. J. vener. Dis.* 1955, **31**, 74.
28. Grimble, A. *Guy's Hosp. Rep.* 1955, **104**, 239.

Annotations

PROGNOSIS OF CARDIOVASCULAR SYPHILIS

IT has never been conclusively proved that specific treatment prolongs life in cardiovascular syphilis. Twenty years ago Padget and Moore [24] claimed that the mortality of syphilitic aneurysm and aortic incompetence was halved by arsenical treatment, but they also found that the average duration of life in those who died was not significantly prolonged. Grant's figures [25] from this country, when re-examined by Moore [26] in 1949, revealed the same phenomenon. There are several reasons why different expressions of the same result may lead to conflicting conclusions. In the first place, it is only fair to compare the duration of life when all the patients are dead. This may mean waiting fifteen or twenty years to complete a follow-up study, and few have sufficient patience for this: yet if the average duration of life is calculated before all the patients are dead the figure will be weighted by those who die early. Another reason lies in the exceptional difficulty of arranging a properly controlled investigation in an increasingly rare disease which exhibits wide variations of age-incidence, duration, and severity. Moreover, it is a disease which is subject to complications, such as neurosyphilis, where specific treatment is undoubtedly effective and cannot be withheld; this prevents the random allocation of patients into treated and control groups which is the essence of a sound therapeutic trial.

An interesting commentary on these problems has been provided in the past year by two notable studies of arsenical treatment in cardiovascular syphilis. In Chicago, O'Brien and his colleagues [27] found no difference in mortality between those who received "adequate" treatment (more than 20 arsenical injections) and those who did not. On the other hand, Grimble,[28] in a careful study of fatal cases treated at Guy's Hospital between 1925 and 1944, reached the opposite conclusion. He claimed that the average duration of life in aneurysm and aortic incompetence was approximately doubled by arsenical treatment, increasing from two to four and a half years.

Neither conclusion can be accepted without comment, and it is instructive to seek the reason for their differences. The American workers, with much larger numbers, compare mortality-rates but do not discuss duration of life in relation to treatment. Moreover, their comparison is made not between treated and untreated patients but between those who have received more or less than an arbitrarily defined "adequate" dose of arsenic. This method, though hallowed by tradition, particularly in American studies of syphilis, is of doubtful validity because no-one really knows what constitutes adequate treatment for cardiovascular syphilis, and doses of the same drug above or below an arbitrary minimum "adequate" quantity may not be very different in their effects. Grimble gets over this difficulty by selecting for comparison totally untreated patients and those who received at least 3 g. of arsenic, and he goes to great lengths to ensure that his treated and control groups should be comparable in other ways. Unfortunately, in doing so, he is forced to discard large numbers of cases so that his final conclusions are drawn from very small groups, the largest of which contains only 17 cases; and this makes his results rather less convincing. Finally, both studies suffer from the defect that the treatment was deliberately chosen by the doctor in charge and was not selected at random.

In the arsenical era to which these papers relate, it was a matter of importance to decide whether life was prolonged in cardiovascular syphilis by a treatment which carried a considerable risk of poisoning or exhausting the patient. Since the introduction of penicillin, however, with its indisputable effectiveness in other forms of syphilis, with its safety and ease of administration, the question whether to give or withhold specific treatment is no longer a live issue. Although no drug can be expected to deal with the mechanical problems of a damaged aorta or an incompetent aortic valve, it seems possible that the process may be retarded by penicillin, and it now remains to be decided what is the proper dosage of this antibiotic. The difficulties of clinical trials in cardiovascular syphilis may mean that the ultimate answer is provided not by the clinician but by the pathologist, and there is need for further work on the histological criteria of active syphilis in the aorta. Such studies might reveal the need to continue treatment for longer than has been customary hitherto.

NON-CELLULAR HISTOLOGY

HISTOLOGY has always been recognised as a little bit of science and a lot of art, and, some would say, a pretty mystical art at that. Even books bearing the title of histo*chemistry* seem full of formulæ for revealing the distribution in cellular sections of sphingolipides or glycoproteins. But cells are no longer the only preparations with proteins and lipoids and carbohydrates distributed throughout their bulk. Every paper electrophoretic strip (and thousands must be produced each day) confronts the biochemical analyst with the same question that faces the histologist: "what is the distribution of interesting components throughout this preparation I have made?". The methods used to reveal, with varying degrees of specificity, the required components on the paper strip are often those of proved histological worth—azocarmine for proteins, Sudan Black for lipides. But Uriel and Grabar [1] go one better: they prepare their electrophoretic medium as a thin transparent film of agar, and the components of the solution under investigation are finally distributed along the strip in a pattern determined by their electrophoretic mobilities and relative amounts. The agar film is then treated like a tissue section, fixed, dehydrated, mounted on glass, and stained by histological procedures. The resulting strip is like a large histological slide, permanent and easily handled, and transparent so that direct photometry is possible.

Perhaps the strip could be more truly likened to a photographic colour transparency, and it might be possible to project the pattern like a lantern slide, if it was protected against the heat. Uriel and Grabar do not mention counter-staining of their agar films, but it should not be beyond the ingenuity of those who combine organic chemistry with histological magic to produce multi-coloured electrophoretic strips. A 3-dimensional presentation may confidently be expected.

1. Uriel, J., Grabar, P. *Ann. Inst. Pasteur*, 1956, **90**, 427.

OBSTETRIC ACUTE YELLOW ATROPHY

THE name "obstetric acute yellow atrophy" was first used by Sheehan [1] in 1940 to describe a condition found at necropsy in 6 patients out of a series of 400 maternal deaths. The clinical features were those of acute yellow atrophy of the liver—namely, vomiting, epigastric pain, jaundice, mental disturbance, coma, and death. The absence of liver-cell necrosis, however, was a conspicuous feature. The most striking histological abnormality in all 6 cases was severe fatty infiltration of an unusual kind; the affected cells were distended with fine fatty droplets which showed no tendency to form the large globules commonly found in fatty infiltration of the liver. Only a narrow rim of cells around the portal tracts looked normal. Despite the very severe involvement of the affected cells, nuclear changes were insignificant and inflammatory reaction absent or slight.

Between 1940 and 1955 only 7 more cases of this kind were reported, but recently Ober and Le Compte [2] have given 3 further examples. These were clinically indistinguishable from fulminant infective hepatitis, and the final diagnosis in each case was made only at post-mortem examination. The histological changes conformed closely to the original description by Sheehan. A remarkable feature of the cases so far described is the smallness of the liver (800–900 g.) despite the absence of histologically recognisable necrosis. As the remaining liver cells were obviously enlarged by their abnormal fat content, the true loss of hepatic substance was even greater than the weight suggests. Since the size of the individual lobules seemed normal, each lobule must have contained fewer than its normal complement of cells. It is remarkable that so great a loss of liver cells can take place in so short a time without leaving a more obvious inflammatory reaction.

As with other manifestations of pregnancy toxæmia, the greatest difficulty is to find the cause. None of the known exogenous causes of severe fatty infiltration seems to be involved; and there was no history of nutritional deficiency, alcoholism, or exposure to hepatotoxic agents. In the absence of any such satisfactory explanation, it must be concluded that endogenous factors are chiefly responsible. Hormonal imbalance, although more often the result than the cause of liver disorder, can, at least in experimental animals, lead to severe fatty infiltration. Graef et al.,[3] for example, have shown that such a change is often found in hypophysectomised dogs. Although nothing in the history or clinical features of these cases indicated a hormonal upset as profound as that, some less drastic hormonal disturbance may be responsible for the fatty infiltration. Much severer grades of fatty infiltration: however, occur both in man and animals without severe hepatic insufficiency. The problems presented, therefore, by this group of cases concern not only the cause of the fatty change but the associated loss of hepatic tissue and the almost invariably fatal hepatic failure.

Most of these obstetric cases showed a fatty infiltration of the proximal convoluted tubules of the kidney, as

1. Sheehan, H. L. *J. Obstet. Gynæc., Brit. Emp.* 1940, **47**, 49.
2. Ober, W. B., Le Compte, P. M. *Amer. J. Med.* 1955, **19**, 743.
3. Graef, I., Negrin, J., Page, I. H. *Amer. J. Path.* 1944, **20**, 823.

well as the liver changes. In at least one instance, there was also an acute hæmorrhagic pancreatitis. On the basis of these findings, Ober and Le Compte see a similarity between the condition in man and the lesions produced in rats by the feeding of ethionine, an unnatural amino-acid that interferes with the proper metabolism of methionine.[4] Since the effects of ethionine can be neutralised by giving methionine there may be some indication for the use of methionine in the treatment of these patients. Aspiration biopsy of the liver, however, seems to be the only way to make the diagnosis before it is too late.

FUNGUS INFECTIONS OF BONE

THE relative importance of diseases caused by pathogenic fungi has increased as the power of chemotherapy has subdued the bacteria. Lesions of bone are by no means rare in many fungus infections, and they are sometimes responsible for the first signs and symptoms of illness. A recent paper by Toone and Kelly [5] notes, for example, 8 instances of bone involvement among 25 cases of systemic fungal infection seen over a period of five years at two general hospitals in Richmond, Virginia. 5 of the 8 cases were examples of blastomycosis and 1 coccidioidomycosis—two conditions rarely if ever seen outside the American continent. The 2 remaining infections were cryptococcosis (torulosis)—a condition well recognised all over the world and occasionally reported in this country.

There have been many American reports of bone lesions in these infections. Potter,[6] in 1910, and Stober,[7] in 1914, were among the earliest to describe bone changes. In systemic blastomycosis multiple granulomatous lesions are associated with local bone destruction and definite periosteal reaction. The bones are said to be involved in as many as 60% of fatal cases,[8] and the lesions are often connected with discharging sinuses. Carter [9] later described rather similar disseminated bony lesions in coccidioidomycosis; and Collins [10] has noted 17 examples of the same type of bony involvement in 200 published cases of torulosis. Bony involvement as the first sign has even been recorded in histoplasmosis,[11] which is occasionally seen in this country and is usually marked by fever, emaciation, anæmia, and widely disseminated lesions.

Actinomycosis is, of course, the commonest systemic fungal infection in this country,[12] and bones are often involved. Bones are usually infected by local extension from soft-tissue lesions: thus the mandible may be attacked in cervico-facial actinomycosis and the spine in the abdominal form of the disease. This mode of spread is in contrast to the blood-stream dissemination which is responsible for bone lesions in the other fungus infections. Infection can also spread directly to bone in maduromycosis (Madura foot), in which a variety of different fungi may be present.

In all these conditions, diagnosis depends ultimately on recovering organisms from pus or other material. Special bacteriological techniques are often needed, and they should be used in the investigation of material from all cases of obscure infection, whether or not fungal cells have been identified on direct microscopic examination. Some, but not all, of these infections, fungal elements can be identified in histological sections, and in recent years the periodic-acid-Schiff staining technique has been found effective.[13–15] Complement-fixing antibodies or hypersensitivity to fungal vaccines are sometimes a help in diagnosis at certain stages of infection.

It is clear that we should be more aware of fungal infections, even in a part of the world where relatively few are endemic. One of the best introductions to the subject for the general reader is the brief monograph [16] by Conant and his colleagues, of Duke University, North Carolina. Added importance has recently been given to prompt and accurate diagnosis by encouraging therapeutic results [17–19] with the aromatic diamdies, particularly 2-hydroxystilbamidine, in blastomycosis, actinomycosis, and cryptococcosis; but no effective treatment has yet been found for coccidioidomycosis and histoplasmosis, or for cryptococcosis involving the central nervous system.

CHILD MENTAL WELFARE

MUCH mental illness can be attributed, in part at least, to disturbances in parent-child relations in the earliest years of childhood. In the past, child-guidance clinics have been regarded as preventive services, but they have never in fact been this, since few children come to these clinics until several years after their troubles begin. The foundations of the parent-child relationship are laid in the antenatal period and during the first few months of the child's life. At this time the parents are facing new anxieties, and their emotional attitudes are often changing. They are then most accessible to help, and quite simple measures may tip the balance in the right direction. Early action necessarily depends upon early recognition, and here the staffs of antenatal and child-welfare clinics have a unique opportunity. But this help can succeed only if the clinic staffs are encouraged to take an interest in mental-health problems and concern themselves actively with preventive mental-health work. There have lately been cheering signs that more is being done in this direction.[20]

The recent report of the committee on maladjusted children [21] recommended that the staffs of child-guidance clinics should coöperate more closely with those of the welfare centres. This is not a new idea: several child-guidance clinics in London have been established in child-welfare centres for eight or nine years; and in 1952 the first comprehensive health-centre was opened by the London County Council at Woodberry Down. It is encouraging, however, to read of further developments. Mackenzie [22] has lately discussed a scheme for "voluntary training" of welfare-centre staff, who are interested in this work. Since 1953 weekly case-conferences have been held at a child-welfare centre. At first they were attended by a welfare-centre doctor and health visitor and by a psychiatrist and a psychiatric social worker. The team was later expanded to include 3 welfare-centre doctors and 2 health visitors. Patients did not attend the conferences. No rigid scheme was followed, but the discussion was generally directed towards clinical problems, the initiative being left with the welfare team. Mackenzie attaches great importance to the presence at the discussion of the welfare-centre doctor and the health visitor concerned with a particular patient; and much of the success of the scheme has sprung from the different approaches of the various members of the team. New

4. Farber, E., Simpson, M. V., Tarver, H. *J. biol. Chem.* 1950, **182**, 91.
5. Toone, E. C., Kelly, J. *Amer. J. med. Sci.* 1956, **231**, 263.
6. Potter, H. E. *Amer. Quart. Roentgenol.* 1910, **2**, 243.
7. Stober, A. M. *Arch. intern. Med.* 1914, **13**, 509.
8. Baker, R. D. *Amer. J. Path.* 1942, **18**, 479.
9. Carter, R. A. *Radiology*, 1934, **23**, 1.
10. Collins, V. P. *Amer. J. Roentgenol.* 1950, **63**, 102.
11. Key, J. A., Large, A. M. *J. Bone Jt Surg.* 1942, **24**, 281.
12. Cope, Z. Actinomycosis. London, 1938.
13. Derry, D. C. L., Card, W. I., Wilson, R. *Lancet*, 1942, i, 224.
14. Hutchison, H. E. *J. Path. Bact.* 1952, **64**, 309.
15. Rodger, R. C., Terry, L. L., Binford, C. H. *Amer. J. clin. Path.* 1951, **21**, 153.
16. Conant, M. F., Smith, D. T., Baker, R. D., Callaway, J. L., Martin, D. S. Manual of Clinical Mycology. Philadelphia and London, 1954.
17. Schoenbach, E. B. *Trans. N.Y. Acad. Sci.* 1952, **14**, 7.
18. Snapper, I., McVay, L. V. *Amer. J. Med.* 1953, **15**, 603.
19. Hancock, B. J. *Lancet*, 1955, i, 1123.
20. See *Ibid*, 1954, ii, 1005.
21. *Ibid*, 1955, ii, 1328.
22. Mackenzie, M. *Med. Offr*, 1956, **95**, 123.

aspects of a case were often brought to light, and in general the staff obtained a new understanding and insight which they were then able to apply in dealing with other patients in their care. Mackenzie's paper shows that this way of working is a valuable advance in preventive mental health and a pointer to further progress.

ELECTROLYTES AND THE ELECTROCARDIOGRAM

THE importance of the electrocardiogram (E.C.G.) in the detection of disorders of electrolyte balance is now generally accepted. The process of ventricular activation is influenced by the ionic concentration of the extracellular fluid bathing the cells of the myocardium, and also by local electrolyte changes in the cells themselves. There is generally a fair agreement between the serum concentration of certain electrolytes and the development of electrocardiographic changes. The electrolytes which produce changes in the E.C.G. are potassium and calcium. Alterations in serum-sodium levels may also indirectly produce E.C.G. abnormalities by inducing acid-base imbalance and altering the potassium-sodium ratio in the extracellular compartment.

Electrocardiographic changes due to a low serum-calcium develop when the level falls below 7–8 mg. per 100 ml. There is an increase in the iso-electric line between the QRS and T deflections; the T wave is unaffected, but the duration of systole (Q–T interval) is greatly prolonged.[1] By contrast, hypercalcæmia shortens the Q–T interval, virtually abolishing the ST segment.[2] Hypokalæmia produces depression of the ST segment, flattening of the T wave, and large U waves.[1–3] Conduction defects and arrhythmias are common. The Q–T interval is prolonged but often difficult or impossible to measure because of the disappearance of the T wave into the U wave.[4] By contrast, hyperkalæmia is associated with greatly augmented positive T waves, and conduction defects in severe cases.

Bellet [2] has closely studied the E.C.G. changes in electrolyte imbalance. He points out that the prolonged Q–T interval in hypocalcæmia can be brought back to normal by the intravenous administration of calcium, and that, although the patterns of low calcium and low potassium states are usually strikingly different, combined deficiencies of the two electrolytes produce atypical pictures. He has examined the E.C.G.s of 125 patients with hypokalæmia from various causes, and has described four patterns. Pattern I consisted of ST-segment depression and a prominent U wave; pattern II included various degrees of T-wave inversion, associated with prolongation of the Q–T interval, and a prominent U wave; and patterns III and IV consisted of positive T waves of various shapes followed by one or more U waves. The diagnostic E.C.G. appearances were most common at levels of serum-potassium below 3·0 m.eq. per litre. Measurements of intracellular and extracellular potassium showed that the E.C.G. pattern correlated better with the extracellular than with intracellular levels. But there was not always close agreement between serum-potassium and the E.C.G., because of variations in the normal range, and because of other factors, such as the administration of digitalis, which shortens the Q–T interval and distorts the ST segment. By contrast, cardiac ischæmia, subendocardial infarction, and myocarditis could produce E.C.G. changes similar to those seen in hypokalæmia, while potassium intoxication has been shown to produce currents of injury resembling acute cardiac infarction or pericarditis.[5] Bellet [2] has also shown that hyperkalæmia may cause the inverted T waves of myocardial infarction to become deeper, and Sharpey-Schafer [6] noted the same result after giving potassium by mouth to patients with inverted T waves from the same cause. When the T-wave inversion was due to ventricular preponderance, however, potassium caused the T waves to become upright.

Bellet has described four stages in the development of the E.C.G. signs of hyperkalæmia in the dog. Stages 1 and 2 consisted of elevation of the T wave with narrowing of the base, and cardiac irregularity due to sino-auricular block (serum-potassium 6–9 m.eq. per litre). In stage 3 the ventricular complexes were widened, and the ventricular rate slow (serum-potassium 10–13 m.eq. per litre). Stage 4 showed slow idioventricular rhythm, and further widening of the QRS (serum-potassium 14–18 m.eq. per litre). The cause of death was usually ventricular standstill, but occasionally fibrillation (at a level of 16–18 m.eq.) in the normal dog. The stages in man were very similar, but less well demonstrated. The effects of hyperkalæmia on the E.C.G. of cardiac infarction were variable, either causing the T wave to become larger and further inverted, or to revert to a positive deflection. In patients with subendocardial ischæmia, potassium produced a diphasic T wave which was not typical of hyperkalæmia. Bellet concludes that the electrocardiographic detection of hyperkalæmia is difficult in the early stages. Certainly augmented positive T waves in precordial leads can result from posterior infarction and pericarditis, and may be the prelude to an anterior ischæmic episode.[7]

Careful attention to the changes in serial electrocardiograms can yield valuable information about electrolyte disorders, but interpretation must take account of the many other factors which may obscure or counterfeit specific changes.

VASCULAR HEADACHE

IT is now well established that the headache of migraine is usually due to distension of arteries, probably both intercranially and extracranially. But, by their quality and accompanying symptoms, many headaches which do not form part of a true migraine syndrome seem to be vascular in origin. Indeed, adequate investigation of headaches of uncertain cause now includes full exploration of the response to vasomotor drugs, both constrictor and dilator. By this means it is often possible to reproduce the spontaneously occurring headache and so plan rational treatment. Wolff [8] and his colleagues have done a great deal in the past few years to clarify these vascular headaches. One of their many contributions is to the technique of recording changes in the extracranial arteries. They have designed an instrument,[9] essentially similar to Mackenzie's polygraph, for recording the arterial pulse-wave via an electronic amplifying system on a direct ink-writer. This device clearly demonstrates changes in the pulse contour in a variety of spontaneous headaches and in those induced by vasomotor drugs. The recorder can be easily applied to the temporal arteries and its branches and to the occipital vessels. Moreover, simultaneous bilateral recording can help to elucidate the mechanism of unilateral headaches. Such investigations have confirmed that changes in vascular tone and calibre—both distension and constriction—may be responsible for headaches. Tunis [10] has given further illustrations of the application of this method to the study of headache and of the effect of allegedly vasomotor drugs. There is no doubt that it provides objective evidence of changes in a field where subjective symptoms are often particularly difficult to assess.

1. Merrill, A. J. *Amer. Heart J.* 1952, **43**, 634.
2. Bellet, S. *Arch. intern. Med.* 1955, **96**, 618.
3. Bellet, S., Steiger, W. A., Nadler, C. S., Gazes, P. C. *Amer. J. med. Sci.* 1950, **219**, 542.
4. McAllen, P. M. *Brit. Heart J.* 1951, **13**, 159.
5. Levine, H. D., Wanzer, S. H., Merrill, J. P. *Circulation*, 1956, **13**, 29.
6. Sharpey-Schafer, E. P. *Brit. Heart J.* 1943, **5**, 80.
7. Brink, A. J., Goodwin, J. F. *Ibid*, 1952, **14**, 331.
8. Wolff, H. G. Headache and Other Head Pains. Oxford, 1948.
9. Tunis, M. M., Wolff, H. G. *Amer. J. med. Sci.* 1952, **224**, 565.
10. Tunis, M. M. *Canad. med. Ass. J.* 1956, **74**, 185.

Special Articles

BEDWETTING

PREVALENCE AMONG CHILDREN AGED 4-7 YEARS

J. M. BLOMFIELD
M.A. Oxfd
RESEARCH-WORKER, POPULATION INVESTIGATION COMMITTEE

J. W. B. DOUGLAS
B.M. Oxfd
SENIOR LECTURER IN PUBLIC HEALTH AND SOCIAL MEDICINE IN THE UNIVERSITY OF EDINBURGH

THE importance of bedwetting as a public-health problem is emphasised by Bransby, Blomfield, and Douglas (1955). We describe here more fully its prevalence in different groups of the population and discuss the extent to which it might be prevented or reduced by changes in environment or in upbringing.

Our data are derived from 5386 children born during the first week of March, 1946. These children were followed up by health visitors during the pre-school years, and on reaching school age were kept under observation both by school nurses and by school doctors. At present, when they are 10 years old, we are still in touch with 4351 children (92% of those who were enrolled in the 1946 survey and are still living in this country). They are fully representative of the whole population of children of their age.[1]

Questions about bedwetting were asked on three occasions by either health visitors or school nurses during home visits made when the survey children were aged $4^1/_4$, 6, and $7^3/_4$ years. At each visit the mothers were asked whether their child was wet by night and, if so, how often. On the second visit they were also asked whether he was wet by day. Information about methods used to cure the wet children was obtained when they were aged 6 and $7^3/_4$ years, and on the last visit the mothers were asked whether any of the sibs of the survey children had been bedwetters.

TABLE I—CHILDREN WET BY DAY

—	Wet by day only	Wet by day and by night	Total
Boys	7	30	37 (*1·8%*)
Girls	30	46	76 (*4·1%*)
Total	37	76	113 (*2·9%*)

In calculating these percentages a correction has been made for the fact that, whereas all children in the upper social groups who were born during the first week of March, 1946, were enrolled in the survey, only 1 of every 4 children in the manual working classes was enrolled (cf. Douglas 1951). This correction is made by giving the former groups a weight of unity and the latter a weight of 4.

We have excluded from this study all children whose histories at any of the three ages chosen were incomplete owing to temporary absence from the survey.[2] This reduced the number of children available from the original total of 4351 to 4294 (2268 boys and 2026 girls).

Children Wet by Day

Information about children who were wet by day was obtained when they were 6 years old, when 113 of them were reported to be wet by day. The numbers of boys and girls affected are shown in table I, the last column of which gives the prevalence for each sex.

Many more girls than boys are wet by day [3]; this sex difference is particularly striking among those who although wet by day, were dry by night.

Owing to the relatively small number of affected children it is unprofitable to make a more detailed study of day wetting. All that need be said is that the variations in prevalence in the different groups of the survey population were, with the single exception of sex, closely similar to those reported below for bedwetters.

Bedwetting

Sex

We have divided the bedwetters (among whom were 3 mongols and 9 mentally defective) into those wet several nights a week (the regularly wet) and those wet less often (the occasionally wet). The proportion of children falling into these groups is shown in table II.

TABLE II—PREVALENCE OF BEDWETTING BY SEX (2268 MALES AND 2026 FEMALES)

—	Percentage frequency of bedwetting at age (yr.): $4^1/_4$	6	$7^3/_4$
Regular bedwetters:			
Male	3·68	4·06	3·55
Female	3·21	3·11	2·30
Occasional bedwetters:			
Male	9·94	7·88	4·54
Female	7·34	5·31	4·11
Total:			
Male	13·62	11·94	8·09
Female	10·55	8·42	6·41

Bedwetting, both occasional and regular, is consistently more frequent among boys than among girls. As regards regular bedwetting, the boys show no decline in prevalence during the survey period, whereas the prevalence among the girls drops by about a third. Thus the difference between the sexes, which is not quite significant at $4^1/_4$ years, is highly significant at $7^3/_4$ years.[4] The position is different for occasional bedwetters, among whom there is a steep decline for both sexes rather greater for the boys than for the girls. In this group the sex difference is highly significant at $4^1/_4$ and not significant at $7^3/_4$ years.[5]

4·3% of the boys and 2·8% of the girls were consistently wet throughout the whole survey period; most of them were reported as regularly wet on some occasions and occasionally wet on others.

TABLE III—PREVALENCE OF BEDWETTING BY PLACE IN FAMILY (REGULAR BEDWETTERS ONLY)

—	Percentage of regularly wet at age (yr.): $4^1/_4$	6*	$7^3/_4$	No. of children † (wet and dry)
Firstborn	2·90	2·79	2·95	1662
Later-born	3·76	4·02	2·93	2621

* $\chi^2 = 3·68$ n = 1 0·1 > P > 0·05.
† There were 11 cards where information on place in family had not been punched.

When the prevalence of bedwetting in the two sexes is combined, the proportion of children reported wet

1. A detailed account of the losses through death, emigration, &c., will shortly be published as part of a comprehensive report on the health, growth, and environment of the pre-school child. For an account of the sample and methods of the inquiry see Douglas (1951).
2. These temporary absences were due to illness or to removal of a family which was still untraced at the time of the survey.
3. $\chi^2 = 18·767$ n = 1 P < 0·001.
4. Comparing the prevalence of regular bedwetting among boys and girls:
   At $4^1/_4$ years $\chi^2 = 3·800$ n = 1 0·1 > P > 0·05.
   At $7^3/_4$ years $\chi^2 = 7·622$ n = 1 P < 0·01.
5. Comparing the prevalence of occasional bedwetting among boys and girls:
   At $4^1/_4$ years $\chi^2 = 13·000$ n = 1 P < 0·001.
   At $7^3/_4$ years $\chi^2 = 2·239$ n = 1 0·2 > P > 0·1.

TABLE IV—PREVALENCE OF BEDWETTING BY SOCIAL GROUP (REGULAR BEDWETTERS ONLY)

Social group	Percentage regularly wet at age (yr.):			Wet throughout the period (%) *	No. of children (wet and dry) †
	4¼	6	7¾		
Professional and salaried	2·21	1·95	1·68	2·07	768
Black-coated	3·27	2·72	1·90	2·08	1102
Manual	3·64	3·81	3·47	2·84	1757
Agricultural	2·74	2·74	1·68	1·90	474

* These percentages include children wet regularly at some periods and occasionally at others.
† 193 children had fathers who were self-employed or engaged in miscellaneous occupations.

was 12·2% at 4¼ years, falling to 10·3% at 6 years, and 7·3% at 7¾ years. The corresponding figures for regular bedwetters were 3·5%, 3·6%, and 2·9%. The proportion consistently wet throughout the period was 3·2%.

Since regular bedwetters give the greatest trouble to their parents and their doctors, we have considered them alone in tables III-VI.

Family Size

The usual impression that bedwetting is more common among children from larger families is only partly borne out by the present study. Table III shows the proportion of bedwetters who were firstborn and later-born children.

When both sexes are taken together, there is no significantly greater prevalence of bedwetting among the later-born, although at both 4¼ and 6 years there is a slight but not significant excess of bedwetters among them. When sex also is considered, this excess is seen to be greater for the boys than for the girls.[6]

TABLE V—SEX DIFFERENCES IN BEDWETTING BY SOCIAL GROUP *

—	Percentage regularly wet at age (yr.):			No. of children (wet and dry)
	4¼	6	7¾	
Non-manual workers:				
Male	3·81	3·41	2·51	997
Female	1·71	1·26	1·03	873
Manual workers †:				
Male	3·83	4·27	4·05	913
Female	3·43	3·43	2·84	844

* Comparing males and females among non-manual workers:
$\chi^2 = 21{\cdot}46$ n = 3 P<0·001.
Comparing males and females among manual workers:
$\chi^2 = 2{\cdot}93$ n = 3 0·5>P>0·3
† Excluding agricultural workers.

The birth of a younger child has been regarded by some as a factor in the ætiology of bedwetting. This view receives no firm support from the present evidence. The prevalence of regular bedwetting among children aged 4¼ years was 3·7% when there was a younger sib and 2·9% when there was none—a difference in the expected direction but of no statistical significance.

Bedwetting among Sibs

In 1953 the mothers of all our survey children were asked to give details of any of their other children who had wetted their beds at night even if they had later become dry. The answers relate to 3536 sibs aged from 5 years to 14 years 11 months in 1953.[7]

Of the 264 sibs of regularly wet survey children 28 (10·6%) had a history of bedwetting, and of the 3272 sibs of dry or occasionally wet survey children 189 (5·8%) had a history of bedwetting.[8]

In addition 480 sibs occasionally wetted their beds, of whom 9·6% had been bedwetters—a proportion that is about twice as great as that among the 2794 sibs of entirely dry children (5·1%).[9]

Thus it appears that the familial element is equal in regular bedwetters and in occasional bedwetters. This does not necessarily imply that there is a genetic basis for bedwetting; it could equally be explained by a common pattern of upbringing.

Social Group

It was expected, from the evacuation experiences of the 1939–45 war (Titmuss 1950, Women's Group on Public Welfare 1943), that there would be a social gradient in bedwetting, and this was found in the present survey (see table IV).

TABLE VI—PROGRESS OF CHILDREN GIVEN DIFFERENT TYPES OF TREATMENT FOR BEDWETTING

—	Type of treatment given (as reported at 6 yr.)			No treatment †
	Clinic	Reward or punishment	Other active measures	
No. regularly wet at 6 yr.	41	67	32	26
Percentage dry by 7¾ yr.	19·5	20·9	31·3	57·7
Percentage improved *	24·4	28·4	28·1	11·5
Percentage unchanged	56·1	50·7	40·6	30·8

* i.e., only occasionally wet at 7¾ yr.
† No treatment was admitted by the mother, but it is likely that all the parents tried various methods at different times, even if no consistent method was used.

The lowest incidence of bedwetting was among children of the relatively prosperous professional and salaried groups and among the children of agricultural workers. The greatest prevalence was among the manual workers, whereas the children of black-coated workers occupied an intermediate position, being nearer the manual at 4¼ years and nearer the salaried at 7¾ years. The gap between the social groups widened with increasing age and was only significant at 7¾ years.[10]

The proportion of children wet throughout the period was similar in each social group, and the excessive number of bedwetters in the poorer groups was apparently made up of children becoming wet for relatively short periods.

We have already remarked on the high prevalence of bedwetting among boys. This sex difference was largest and only significant in the professional and black-coated groups, and part of the unfavourable position of the children of manual workers seems to be explained by the high prevalence of bedwetting among the girls (see table V).

Geographical

There were no significant differences in the proportion of children reported as bedwetters for the various regions of England; nor were there any significant differences

6. The excess among later-born boys is significant at 6 years:
$\chi^2 = 4{\cdot}773$ n = 1 0·05>P>0·02.

7. Owing to certain sorting difficulties, sibs under 5 were excluded from the following analysis. Sibs of 15 years and over were also excluded because many of them had left home and this had made it impossible to define with any certainty the complete population of these older children.

8. Comparing these two groups of sibs:
$\chi^2 = 9{\cdot}891$ n = 1 P<0·01.

9. Comparing these two groups of sibs:
$\chi^2 = 15{\cdot}332$ n = 1 P<0·001.

10. At 4¼ years $\chi^2 = 3{\cdot}886$ n = 3 0·3>P>0·2.
At 6 years $\chi^2 = 7{\cdot}144$ n = 3 0·1>P>0·05.
At 7¾ years $\chi^2 = 11{\cdot}685$ n = 3 P<0·01.
When non-manual workers are compared with manual workers, significant differences are found in each year.

between children in England and those in Wales and Scotland.

Effectiveness of Therapy

Of the 136 children regularly wetting their beds at $4^1/_4$ years 27·2% had become dry by the age of 6 years. Of those regularly wet at 6 years 31·6% were dry at $7^3/_4$ years. It is of interest to see to what extent the progress of these children is related to the measures taken to cure them. We have no information about the earlier period; but, when the children were 6 years old, their mothers were asked about treatment. The answers given were divided into the four broad groups shown in table VI, where they are related to the proportion of children cured and improved between the ages of 6 and $7^3/_4$ years.

It might appear from this table that the best progress was made when there was no attempt at treatment, and the least progress when the child had been taken to a doctor or a clinic.[11] It should be emphasised that we have no information about the selection of children for different types of treatment; it would, for example, be a sufficient explanation of these differences if only the children resistant to minor measures of reassurance and persuasion were taken to clinics or more actively dealt with by their parents.

Discussion

The size of the problem of bedwetting is best shown if the percentages given above are used to calculate the number of children in the whole population who are affected at different ages at the current level of births. Among children aged 4 years in Britain we would expect about 80,000 occasional and 30,000 regular bedwetters, and among children aged 7 years 30,000 occasional and 20,000 regular bedwetters. At any one time there would be about a third of a million bedwetters aged $4^1/_4$–$7^3/_4$ years. These numbers are based on the 1% Census Tables and on the prevalences given here, which agree closely with those reported by other workers—c.f. Bransby et al. (1955)—and are, if anything, an underestimate.

Comparisons of the prevalence of bedwetting in different social groups suggest that between a third and a half could be prevented by changes in upbringing and environment. In other words, they show bedwetting as an important problem of public health. Unfortunately, at present we have little knowledge of the various patterns of child-rearing in different sections of the community. It is evident from the present inquiry that there are great social differences in the time that toilet training is started and control achieved; but, owing to the wide distribution of the sample, detailed histories of training are not available. The poorest families start training latest, and their children are also late in achieving control.[12] In addition we find in each social group that early training is associated with a low prevalence, and late training with a high prevalence, of bedwetting at later ages.[13]

These observations suggest that at least part of the social difference recorded is the result of different patterns of training. That it is not wholly so is shown by the fact that among agricultural workers toilet training starts late and the prevalence of bedwetting is low.

The importance of bedwetting lies not only in its being a common source of worry and inconvenience to mothers but also in its effects on the later adjustment of the child. This will be the subject of a further study, when we have had greater opportunity to observe the progress of these children and to receive reports from their school-teachers and school doctors.

11. Comparing the proportions dry by $7^3/_4$ years: $\chi^2 = 14{\cdot}57$ $n = 3$ $P<0{\cdot}01$.
12. The proportions of mothers who did not start toilet training until after the sixth month were: professional and salaried 8·7%, black-coated 9·8%, manual 16·4%, agricultural 14·9%.
13. For the whole sample the proportion of children regularly wet at $4^1/_4$ years was 2·8% for those whose toilet training was started during the first six months and 4·2% for those whose training started later. The corresponding figures at 6 years were 2·6% and 4·2%, and at $7^3/_4$ years 2·2% and 3·5%.

Summary

The prevalence of wetting during the day and at night among 2268 boys and 2026 girls drawn from all social groups and from all parts of Great Britain is described. These children were observed throughout the first ten years of their lives.

At 6 years 1·8% of the boys and 4·1% of the girls were wet by day. For both sexes together the prevalence of day wetting was 2·9%.

12·2% of all children aged 4 years wetted their beds, and by the age of $7^3/_4$ years the proportion had dropped to 7·3%.

At each age fewer girls than boys wetted their beds, and among those severely affected—i.e., who wetted their beds several nights a week—the difference between the sexes increased with increasing age.

These sex differences were most obvious (and only statistically significant) in the more prosperous families.

The lowest prevalence of bedwetting was found among the well-to-do and among agricultural workers. Social differences in prevalence were well marked for girls but not for boys, and the high prevalence in the poorer groups is partly explained by the large proportion of girls affected.

More sibs of bedwetters wetted their beds than did the sibs of dry children.

No significant differences in bedwetting were found between firstborn and later-born children, between children with younger sibs and those without, and between children living in different parts of Great Britain.

Bedwetting is an important problem for the child-welfare and the school medical services since it appears that its prevalence could be considerably reduced by changes in upbringing or in environment. But further research, particularly into patterns of child-upbringing in the different social groups, is needed before effective preventive action can be taken.

This survey is being made by a joint committee of the Institute of Child Health (University of London), the Society of Medical Officers of Health, and the Population Investigation Committee. The chairman of the committee is Prof. James Young, the vice-chairman Prof. A. A. Moncrieff, and the secretary Prof. D. V. Glass. The Nuffield Foundation has financed this inquiry during the pre-school years, and grants for continuing it in the primary-school period have been made by the board of governors of the Hospital for Sick Children, Great Ormond Street, through the Institute of Child Health, and by the Ford Foundation. Fourteen regional hospital boards have also made grants to the inquiry from their free moneys.

We wish to thank the chairman and members of the joint committee for their help and advice; the medical officers of health and the health visitors, whose generous coöperation made the survey possible; and the mothers in all parts of the country, who willingly answered numerous and detailed questions about their children's health.

REFERENCES

Bransby, E. R., Blomfield, J. M., Douglas, J. W. B. (1955) *Med. Offr*, **94**, 5.
Douglas, J. W. B. (1951) *Popul. Stud.* **5**, 35.
Titmuss, R. M. (1950) Problems of Social Policy. London.
Women's Group on Public Welfare (1943) Our Towns. London.

TUBERCULOSIS IN A HOSPITAL FOR THE MENTALLY DEFECTIVE

R. G. LOUDON
M.B. Edin., M.R.C.P.E.
REGISTRAR

J. WILLIAMSON
M.B. Glasg., M.R.C.P.E.
MEDICAL SUPERINTENDENT

ROYAL VICTORIA DISPENSARY, EDINBURGH, DEPARTMENT OF TUBERCULOSIS AND RESPIRATORY DISEASES, UNIVERSITY OF EDINBURGH

D. F. ROBERTSON
M.B. Edin.
MEDICAL OFFICER, GOGARBURN HOSPITAL, EDINBURGH

IN the report of the committee appointed by the Medical Research Council in 1941 to investigate the war-time increase of tuberculosis the following statement appears :

"The Committee therefore recommends that in order to improve casefinding in mental hospitals, efforts should be made, so far as possible, to take periodical chest x-rays of all residents, whether they have symptoms or not, in order to discover and treat early cases. . . . These suggestions and recommendations for mental hospitals should be taken to apply also to institutions for mental defectives." (Medical Research Council 1942.)

TABLE I—PREVALENCE-RATES OF RESPIRATORY TUBERCULOSIS IN VARIOUS MENTAL INSTITUTIONS ON FIRST SURVEY

Reference	Country	Date of survey	No. examined	Proportion (%) with significant respiratory tuberculosis		
				Male	Female	Total
Katz et al. (1954a) ..	U.S.A.	1941	ca.90,000	6·8	4·7	5·7
Oechsli (1949)	U.S.A.	1946	25,914	—	—	8·25
Mann (1952)	England	1950	1199	5·6	—	—
Early (1950)	England	1944	1240	8·5	3·9	5·9
Frappier et al. (1952)	Canada	1946–49	4685	6·04	6·88	6·36
Ruskin (1945)	U.S.A.	1937–43	1852	—	—	7·1
*Theodos (1948) ..	U.S.A.	1938–39	1733	—	—	4·49
Hamer and Wentzel (1938) ..	Netherlands	1938	687	—	—	3·1

* Institution for mentally defective.

In the light of this recommendation it is disappointing to find that, twelve years later, the Board of Control (1955) dismisses in six lines the subject of tuberculosis in mental hospitals, stating that the tuberculosis prevalence-rate was 13·1 per 1000. It is almost certain, from both published work and the results of the present survey, that the greater part of the tuberculosis in mental hospitals remains undiagnosed, and that the figures given greatly underestimate the seriousness of the position.

There are no grounds for satisfaction in the further statement (Board of Control 1955) that the death-rate from tuberculosis in mental hospitals in 1954 was 160 per 100,000, even if this is the lowest yet recorded. This is 8·94 times the 1954 death-rate from tuberculosis for the whole of England and Wales (17·9 per 100,000). The General Board of Control for Scotland (1955) does not mention tuberculosis at all.

Where exhaustive surveys have been made in mental hospitals, the incidence and prevalence of tuberculosis have been consistently found to be great. Often 3–6% of the patients have clinically significant respiratory tuberculosis. The prevalence in males has usually been found to be twice that in females. The prevalence of tuberculosis has been shown to increase progressively with length of residence in the institution (Ruskin 1945, Oechsli 1949). All workers agree that the only successful method of detecting tuberculosis in this type of person is by periodic X-ray examination.

Table I shows the results of some surveys of the prevalence of tuberculosis in mental institutions.

There is little evidence to support the view that mental disease per se is associated with decreased resistance to tuberculosis (Ruskin 1945, Katz et al. 1954a). The high morbidity and mortality rates of tuberculosis in mental institutions could be explained purely on epidemiological grounds. The application of epidemiological measures of control has produced a satisfactory decline in the morbidity and mortality of pulmonary tuberculosis—e.g., from 4·8 to 1·9 per 1000 per annum (Katz et al. 1954b).

Present Survey

The present survey was made in the early part of 1955 in an institution for mentally defective. The hospital is of recent construction, and the wards are of good design and situated in spacious grounds. The diet is satisfactory in every respect. The hospital is licensed to accommodate 600 mentally defective, and at the start of the survey there were 636 inmates (364 males, 272 females). Fig. 1 shows the composition of the hospital population according to age and sex. In common with other institutions of this type there is some overcrowding, which varies from time to time. In some wards the overcrowding is greater than appears from the figures. In the ten years 1945–54 there were 383 admissions and 125 discharges. 25 of 98 deaths were attributed to tuberculosis ; it is impossible to say whether this figure is an overestimate or an underestimate, because only a few came to necropsy.

Methods

Tuberculin Testing.—Tuberculin tests were done on all the patients. The test used was the Heaf multi-puncture test (Heaf 1951). The tests were read at seventy-two hours.

Radiography.—All patients with positive tuberculin tests were submitted to radiography. Negative reactors with either chest symptoms or significant constitutional disturbance were also radiographed. The only X-ray apparatus in the hospital was a small portable machine. For this reason a 35-mm. mass mobile radiography unit was used for the preliminary examination. Any significant abnormality on the 35-mm. film, or any technical difficulty

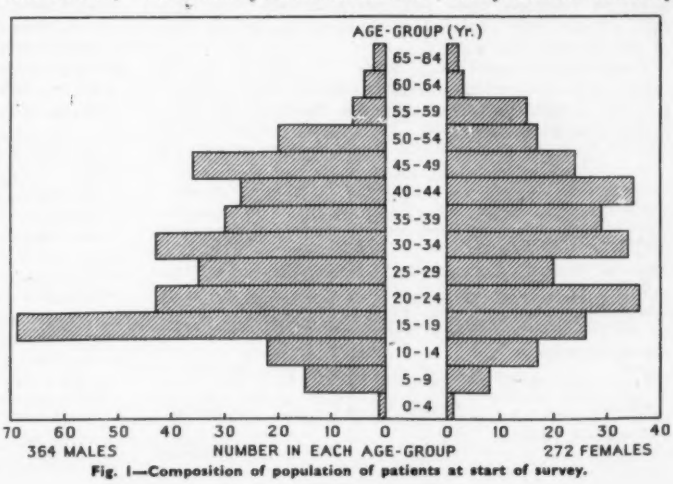


Fig. 1—Composition of population of patients at start of survey.

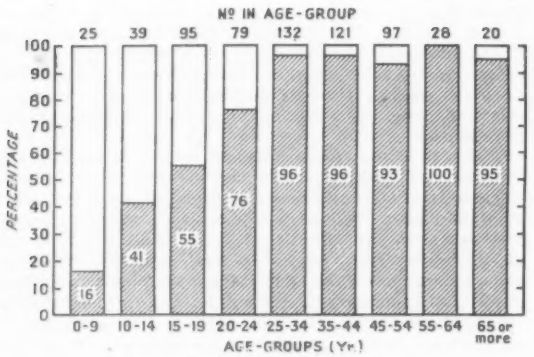


Fig. 2—Results of tuberculin testing.

led to recall for a full-sized film, again taken by the mass-radiography unit. In some cases the patient was too ill or too uncoöperative for this to be done; in such cases the hospital portable apparatus was used. In some patients it was necessary to make several exposures before a completely satisfactory film was obtained.

Clinical and Bacteriological Examination.—Where any significant abnormality was detected on the full-sized chest radiograph the patient was examined clinically and as complete a history as possible was obtained. Attempts were made to obtain sputum for examination by microscopy of the concentrated deposit and by culture for tubercle bacilli. Many of the specimens obviously did not come from the patient's lower respiratory tract. Whenever no sputum could be obtained an attempt was made to isolate tubercle bacilli from laryngeal swabs and fæces.

Results

Tuberculin Testing.—All 636 patients in the hospital at the start of the survey were tuberculin-tested, and 512 (80·50%) were positive. Fig. 2 shows the result of tuberculin testing according to age-groups: 80·22% of males and 80·88% of females were positive; in each age-group the percentage positive was similar for males and females, and the results are shown for both sexes together.

Radiography.—Of the 512 tuberculin-positive patients at the start of the survey 6 left the hospital and 1 died of non-tuberculous disease before the radiographic survey. The remaining 505 positive reactors all had satisfactory chest radiographs and 32 of these were considered to be abnormal. 25 of the 124 tuberculin-negative patients were radiographed and 2 of these radiographs were abnormal. Table II shows the result of the radiographic survey.

Bacteriology.—Specimens were examined bacteriologically in every case where tuberculosis seemed a possible diagnosis. No tubercle bacilli were found in any specimen.

TABLE II—FINAL RESULTS OF SURVEY

—	Males	Females	Total
Population surveyed	359	270	629
Abnormal lungs:	26 (*7·24%*)	8 (*2·96%*)	34 (*5·41%*)
Non-tuberculous lung disease ..	7 (*1·95%*)	1 (*0·37%*)	8 (*1·27%*)
Respiratory tuberculosis	19 (*5·30%*)	7 (*2·59%*)	26 (*4·14%*)
Significant tuberculosis:	17 (*4·74%*)	6 (*2·12%*)	23 (*3·66%*)
Active tuberculosis	7 (*1·95%*)	4 (*1·48%*)	11 (*1·75%*)
Observation tuberculosis	10 (*2·79%*)	2 (*0·74%*)	12 (*1·9%*)
Insignificant tuberculosis	2 (*0·56%*)	1 (*0·37%*)	3 (*0·48%*)

Diagnosis and Classification.—Final diagnosis in each case was reached mainly on an interpretation of the radiograph or a series of radiographs. In many cases the diagnosis of tuberculosis was not considered beyond doubt until some months had elapsed and serial radiographs had been taken. In all doubtful cases where the lesion may have been non-tuberculous pneumonia the response to penicillin was assessed radiographically as a first step. The response to antituberculous drugs also helped in reaching a diagnosis. All the patients were allocated to two main groups—tuberculous and non-tuberculous. The tuberculous patients were grouped into those with insignificant and those with significant lesions, the latter being further divided into those thought to be active and therefore requiring treatment and those thought to be quiescent but still requiring careful observation. Table II shows the final results of the survey, classified as described.

Discussion

The results of the present survey are similar to those already published. Of 629 patients 23 (3·66%) showed significant tuberculosis, of which 11 cases (1·75%) were considered active. 7 of the active cases were in males and 4 were in females; 3 showed definite cavitation. 6 of the cases of significant tuberculosis were previously known to the hospital authorities. There is no reason to suppose that the prevalence of pulmonary tuberculosis in the hospital surveyed was any higher than in other similar institutions. Oechsli (1949) has shown that the prevalence of tuberculosis in mental hospitals may be twice as great as in mental defective institutions.

It is particularly appropriate that attention should be drawn to this state of affairs when the mental hospital service is undergoing development. Not only is the problem serious for patients within the hospital, but also, with the present improvements in treatment and the resulting high discharge-rate of patients to their own homes, measures should be taken to prevent the spread of tuberculosis in the general community by patients who have been discharged from mental hospitals and have developed tuberculosis while in hospital. In 1954, in England and Wales, 65,329 patients left mental hospitals and institutions for mentally defective and returned to life in the general community; the corresponding figure for Scotland is 6476.

Control of Tuberculosis in Mental Institutions

The steps necessary for the control of tuberculosis in mental hospitals are well known and have been applied with encouraging results in several countries, particularly the United States. With the advent of effective chemotherapy and its facilitation of sputum conversion even in chronic and advanced cases, it should be possible to produce better and more rapid results. We suggest the following scheme of control:

(1) Survey of all patients, including tuberculin testing and radiography of positive reactors. Where possible, negative reactors should also be radiographed.

(2) Thorough investigation of all cases with abnormal radiographs and segregation of those with significant pulmonary tuberculosis.

(3) B.C.G. vaccination of all negative reactors to tuberculin, once segregation of all possible sources of infection has been secured.

(4) Annual radiography of all patients whether or not they have been radiographed in the preceding months.

(5) Radiography and tuberculin testing of all newly admitted patients and immediate segregation of any showing abnormalities suggesting tuberculosis, and B.C.G. vaccination of any negative reactors to tuberculin.

Possibly these measures could best be implemented by setting up special units for mental patients with

pulmonary tuberculosis, as suggested by Early (1950), who estimated that about 2·5% of the regional mental-hospital beds should be formed into one tuberculosis unit, the optimal size of which would probably be about 150 beds.

Summary

Tuberculin and radiographic surveys were made in an institution for mentally defective.

3·66% of the patients were found to have significant pulmonary tuberculosis, half of which was considered to be active.

These figures agree closely with published surveys made in similar institutions.

Suggestions are made for the control of tuberculosis in mental institutions.

Thanks are due to Dr. Reginald Bailey, physician-superintendent, Gogarburn Hospital, for his willing coöperation which made this survey possible; Dr. P. W. Tait, medical director, mass-radiography unit; and Dr. A. T. Wallace for bacteriological investigations.

REFERENCES

Board of Control (1955) Annual report for 1954. London.
Early, D. F. (1950) *J. ment. Sci.* **96**, 199.
Frappier, A., Guy, R., Painchaud, C. A., Desjardins, R., Landry, P., Samson, M. (1952) *Canad. J. publ. Hlth.* **43**, 242.
General Board of Control for Scotland (1955) Annual report for 1954. London.
Hamer, B. C., Wentzel, J. M. (1938) *Ned. Tijdschr. Geneesk.* **82**, 2398.
Heaf, F. (1951) *Lancet*, ii, 151.
Katz, J., Kunofsky, S., Locke, B. Z. (1954a) *Amer. Rev. Tuberc.* **70**, 32.
— Plunkett, R. E., Brill, H. (1954b) *Psychiat. Quart.* **28**, 416.
Mann, B. T. (1952) *Brit. med. J.* i, 1228.
Medical Research Council (1942) *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 246, p. 27.
Oechsli, W. R. (1949) *Publ. Hlth Rep., Wash.* **64**, 4.
Ruskin, D. B. (1945) *Amer. Rev. Tuberc.* **52**, 248.
Theodos, P. A. (1948) *Ibid*, **58**, 237.

GENERAL MEDICAL COUNCIL

At the opening of the council's 192nd session, on May 29, Sir David Campbell, the president, remarked that in the recent elections of direct representatives of the medical profession to the council, 41% of the electorate in England had voted. It was a matter of concern that 2380 (4½%) of the voting papers issued in the English election were returned as dead letters, with the consequent disfranchisement of the practitioners to whom they were sent. Apparently "the tendency of addresses to become inaccurate still moves nearly as fast as the process of correction." In the long run a high level of accuracy would be achieved and maintained only by the coöperation of every member of the profession in making sure that his registered address was one at which letters would reach him.

The executive committee had lately decided to recognise the degrees of the University of Baroda in respect of the Medical College, Baroda, the degrees of the University of Nagpur in respect of the Medical College, Nagpur, the degrees of the University of Rajputana in respect of the Sawai Man Singh Medical College, Jaipur, and the diploma of membership of the State Medical Faculty of West Bengal in respect of persons who had studied at a medical college affiliated to the University of Calcutta.

At its last session the council had adopted new rules as to courses of study and examinations for diplomas in public health. These rules, superseding those adopted in 1945, made no provision for a certificate in public health but in other respects did not differ substantially from the previous rules. The new rules would come into operation on Oct. 1, 1956.

A Bill for consolidating the Medical Acts and statutory provisions passed between 1858 and 1950, of which there were more than twenty, was now in an advanced state of preparation, and was indeed likely to be presented in the House of Lords almost at once.

The President referred to an appeal by a practitioner to the Judicial Committee of the Privy Council against a decision by the Medical Disciplinary Committee to erase his name from the Register.[1]

"The Disciplinary Committee will . . . no doubt wish to consider at an early date the desirability of widening one or more of their existing rules in the manner which their Lordships have been so good as to indicate. I must add, however, that under section 16 of the Medical Act, 1950, it will be necessary for the committee to consult with certain outside bodies before amending the rules."

On July 4, when the Dentists Act, 1956, would come into operation, the responsibilities of the council in regard to dentistry would cease. These had lasted for 88 years, and it was hard nowadays to picture the situation as it was when they began. On the one hand, dental surgery was historically a branch of surgery; on the other, there were many persons at that time who, with a limited practical training, were occupied with dentistry as a trade or craft rather than as a profession. The first Dentists Register, published by the council in 1879, contained the names of 483 licentiates—and no graduates—in dental surgery, together with 4806 persons who, on their own declaration, were stated to be engaged in the bona-fide practice of dentistry. The 1922 Register, the last Dentists Register published by the council, contained the names of 4768 licentiates or graduates in dental surgery. Today there were 15,895 names on the Register, including 12,521 licentiates or graduates. At the end of its long period of trusteeship, the council handed over its remaining responsibilities in the dental field with the greatest good will to the new General Dental Council. The G.M.C. would not lose all contact with dental education and examinations, for under the new Act it was to nominate six of its number to act and vote for those particular purposes as members of the General Dental Council.

Public Health

TRACING A TYPHOID CARRIER
BY MEANS OF SEWER SWABS

F. Bedo Hobbs
B.A., M.D. Camb., M.R.C.P., D.P.H.
MEDICAL OFFICER OF HEALTH, FARNHAM U.D.C.

On Jan. 10, 1955, a boy, aged 7 years, was admitted to the isolation hospital with a diagnosis of ? encephalitis. He had been taken ill five days previously with a sore throat and a rash and was at first thought to have scarlet fever. He had a swinging temperature up to 105°F and was very drowsy.

During the next seventeen days this high swinging temperature continued and he was extremely ill. His motions were loose and incontinent, and this was at first thought to be due to the aureomycin with which he was being treated. Blood-culture, Paul-Bunnell, and other tests were negative, and it was not until Jan. 22 that the Widal test was found to be positive and typhoid bacilli were found in the stools, and the case was first notified to me.

On investigating, I found that the patient had not been out of Farnham except to visit Harringay Circus on the day previous to the onset of the illness. He had eaten no ice-cream, shell-fish, watercress, &c., and, since the other inmates of the house were quite well, food did not appear to be the source of infection. His mother, however, told me that he, together with two other boys, had been playing in a field where there had been an overflow of sewage during the recent heavy storms, and that he had come home with his boots covered in sewage. This seemed to be a very likely source of infection; so I decided to take samples of sewage for bacteriological examination.

1. See *Lancet*, May 5, 1956, p. 641.

Tracing the Source of Infection

Swabs were placed in the sewer in three different places: (1) near the manhole from which the sewage had escaped; (2) at a sewer junction about 200 yards away; and (3) at a pumping station half a mile away through which passed sewage from most of the houses on the south side of the town. These swabs consisted of rolled-up pieces of gauze and were suspended in manholes at such a level that the sewage flowed over them. They were left in situ for three days.

The first examination produced negative results in all cases. When it was repeated, however, the swabs from the sewer junction and the pumping station grew *Salmonella typhi*.

Meanwhile I had looked through my records and found that in the previous 28 years there had been five cases of typhoid in Farnham. Inquiries showed that one of these patients could not be traced, one had left the district, one was dead, and two were still living in Farnham. One of these was the patient's uncle and had had typhoid 26 years ago. He was immediately suspected, but he lived in a different house and had not seen the patient for some six to eight weeks before the onset of the illness.

Fæces and urine from these two ex-typhoid patients were examined but gave negative results. Because they might be excreting bacilli intermittently, swabs were placed in the manholes of the sewers from each of the houses occupied by these people. Immediately, a positive result was obtained from the house occupied by one of the ex-typhoid patients, who lived on the south side of the town and had had typhoid 5 years ago. The other specimens were negative. Further positive results were obtained from the pumping station and a sewer through which the sewage from the affected house flowed.

The man who had had typhoid was naturally thought to be the source of this contamination, but three consecutive specimens of urine and fæces all gave negative results.

The only other occupants of the house were his wife and his mother-in-law, Mrs. A. Specimens were then obtained from them, and those from Mrs. A gave positive results in urine and fæces.

This woman, aged 74, had spent many years of her early life in India and Egypt, and although she had never to her knowledge had typhoid she did have some obscure and prolonged illness just previous to and after the birth of her daughter about 35 years ago. This was probably typhoid. 30 years ago her son had typhoid at the age of 3 years. Her son-in-law, Mr. B, when he had typhoid 5 years ago, was living in a different house but stated that he often had meals with Mrs. A.

Cultures from the patient, the sewer swabs, and Mrs. A all belonged to the same untypable Vi strain and were identical with that obtained from Mr. B 5 years previously. It seems reasonable to assume, therefore, that Mrs. A had typhoid in Egypt some 35 years ago and has been excreting bacilli ever since and, as a result, infected her son 30 years ago, her son-in-law 5 years ago, and, lastly, the boy who had been paddling in the contaminated sewage.

Points of interest are as follows:

(1) The place where the boy was paddling was at least three miles from the original source of infection, and the sewage was heavily diluted with storm water.

(2) Although Mrs. A had probably been excreting typhoid bacilli for some 35 years she has, so far as we know, infected only three people.

(3) The swabs placed in the sewers gave consistent results.

Treatment of the Carrier

The treatment of typhoid carriers is extremely unsatisfactory. Recently, promising results were reported from America from using 3 mega units of penicillin every six hours, together with probenecid 1·5 g. twice daily for ten days (Parker et al. 1953).

C. A. Rumball (Ministry of Health, personal communication), in dealing with R.A.F. cases abroad, used 2 mega units of penicillin three-hourly with 0·5 g. of probenecid six-hourly for seven days, together with 5–8 g. of sulphadimidine daily. The essence of the treatment is to secure and to maintain a high blood-penicillin level by combining it with probenecid, which temporarily inhibits the renal tubules. The treatment has been used in this country in mental hospitals, where typhoid carriers are somewhat common.

According to Dr. Grant Nicol (personal communication), of the Ministry of Health, the results so far to hand have been very variable, but about 30% of the carriers treated ceased to excrete bacilli and remained free for a year or more. Others relapsed as soon as the treatment was stopped. The treatment is not without risk, particularly to people with damaged kidneys or a poor cardiovascular system.

Before treating a patient it is advisable, therefore, to investigate thoroughly the cardiovascular system and to make an electrocardiogram, besides testing the kidney functions (blood-urea level, urea-concentration test, and alkali reserve).

Treatment would consist of 28 or 56 injections of penicillin according to the method adopted, and the blood-penicillin level should be checked after 24 hours and 3 days to see that a satisfactory concentration of penicillin is being obtained.

The present carrier is a frail old lady aged 74, and I did not think it desirable to subject her to all this with only a 30% chance of cure, and instead gave her a course of tetracycline, which I recently found to be very effective in the treatment of Sonne dysentery. It did not, however, have any effect.

I should like to acknowledge the great help received from Dr. G. T. Cook, of the Public Health Laboratory at Guildford, in the pathological investigations.

REFERENCE

Parker, R. T., Fitzgerald, J. C., Woodward, T. E. (1953) *J. clin. Invest.* **32**, 593.

Contaminated Flour

The poison responsible for the outbreak [1] at Pontardawe, Glamorgan, has been identified as 'Endrin,' an isomer of dieldrin, which is a constituent of certain pesticides and insecticides. Further investigations are being made to discover how the flour became contaminated, but there is no evidence whatever that it happened during crop-spraying or any other insecticidal measure. Over 100 people were involved, and they became ill one to three hours after eating the poisoned bread. Those most severely affected had epileptiform fits. They all recovered.

Spilled Virus

Four boxes of poliomyelitis virus were carried by aeroplane last week from Washington to Baltimore and when they arrived one was found to be broken and its contents spilled.[2] The crew and cargo-handlers were given injections of poliomyelitis vaccine and the aircraft was decontaminated. At the suggestion of Dr. Salk, passengers were advised to have gamma-globulin.

Another Hazard of Smoking

The manager of a grocer's shop in Acton, London, smoked his pipe while at the bacon slicer, with uncovered bacon and cheese nearby.[3] He had previously been warned by a sanitary inspector that he was liable to prosecution under the new Food Hygiene Regulations [4] for smoking in a place where there was open food. He was fined £6 and 2 guineas costs.

1. See *Lancet*, May 19, 1956, p. 754.
2. *Times*, May 28, 1956.
3. *Ibid*, May 24, 1956.
4. See *Lancet*, 1955, ii, 1388; *Ibid*, Jan. 14, 1956, p. 87.

In England Now

A Running Commentary by Peripatetic Correspondents

FOR many years it has been my lot to stick needles periodically into other people's children—but last week found me at the other end of the needle. I arrived at 9.30 A.M. at a welfare centre in North London with my eight-year-old son and sat in company with a dozen other ladies and their children waiting with identical appointment-cards for our first injection against poliomyelitis. It was a curiously assorted gathering, reminding me of hours once spent during a pregnancy at a laundrette. Conversation established that the birthdays of all children present fell in March or November. No further confidences were exchanged, because my neighbour asked me in a ringing tone if I were not scared—adding that she nearly hadn't come herself. At once I too experienced unreasonable terror, but glancing at the faces of the elder children and seeing the stony look on my son's, I explained that the know-all to whom I am related by marriage considered us to be in the category of (small) football-pool winners. I got the impression that not even my son believed me, and the evidence of our ears now proved that some of our predecessors behind the closed door shared my neighbour's views.

Soon it was our turn to enter this door and roll up the left sleeve. The injection (most expeditiously performed) was followed by advice to take no violent exercise for a week—no swimming in particular. The first signs of distress now appeared, and my offspring's eyes filled with tears, "No cricket?" asked this little Briton. The lady doctor's voice took on a more strongly Continental note: "Ah, cricket," she said musingly, "cricket is something I do not understand—but not a very violent game I think."

* * *

"Cambridge should be a man's university" was the creed graduates and undergraduates of my generation held in the '20s. Women had been enfranchised; they had gained equality in all the other British universities; and they should be content. Members of Girton and Newnham attended lectures and were like ordinary undergraduates until they came to the end, when they were allowed to take their degrees by diploma and (lucky beggars) did not have to pay graduation fees. Their chief grievance was that they could not hold university posts.

The crisis came, so we thought, in 1921 when a grace before the senate recommended that women should be admitted to degrees and given representation on the council of the senate. The hackneyed phrase "controversy ran high" was an understatement. Clergymen, who rarely left their parishes, were coming up to vote, and doctors, who were supposed to be absolutely opposed to the idea, were travelling in force despite great inconvenience. Such were the rumours founded on hearsay and sometimes not even on that. The great day arrived and 1602 graduates voted. The figures were given from the Senate House: PLACET 694, NON PLACET 908. The crowd, on hearing that the non-placets had defeated the grace and kept the women in their place, rushed to Newnham. The gates were closed against us. Tree trunks were quickly collected from nowhere and used as battering rams against the wrought-iron gates. (Vandals rarely know the beauty of the things they mutilate, and it was a shock to all of us to find that these gates were of great artistic value.) The authorities had phoned the police, who arrived expeditiously; and the word quickly went round, "The police have drawn their truncheons." It is 35 years ago, but I can still remember doing my right-about-turn and sneaking off like a dog with his tail between his legs. Retribution in kind was offered at once; but true retribution came later, and as it came slowly led to conversion.

Marriage, an educated wife, and two daughters as worthy of our university education as my son, have all played a part. So has women graduates' ready acceptance of the responsibilities of educated citizens.

In 1947 women were admitted to full membership of Cambridge University, and equality and equity were achieved, if we except their ineligibility for the office of proctor and esquire bedell. All would now be well if Girton and Newnham could take all the eligible women who want to have a Cambridge University education; but they cannot, and these two colleges and all the men's colleges have tried to remedy this by helping in their divers ways to found a third women's college, New Hall. It will want help from every quarter if it is to become a seat of learning like its Victorian sister colleges, and my hope is that many of my generation who enjoyed their years at Cambridge will help to give more women the benefit of what we all feel Cambridge provides, the best education in the world.

* * *

Wandering round an exhibition of historical documents at Portsmouth the other day, I noticed a letter from one John Aylward sending the overseers of the poor of Portsmouth an account for medicines and attendance provided from Nov. 20, 1784, to March 15, 1785, by Edward Hale and John Cotman, two surgeons living at Hambledon. The bill came to £6 8*s.* and it is endorsed by the surgeons of the Portsmouth Workhouse as follows: "We have examined the within bill and are of the opinion that forty shillings may be deducted therefrom, with propriety." The charges included 2*s.* 6*d.* for "a nervous mixture" and 5*s.* for "a journey." A second more sympathetic endorsement runs: "We whose names are hereunto subscribed are much astonished to see the signatures of two gentlemen of the Faculty so very improperly placted to this Bill, intimating an Imposition in the Charge, as they are very certain they themselves wd. have made it double for so long an attendance even at their next door." Mileage and prescription charge always seem to have been live issues.

* * *

Personally I prefer our Aylesburys wrong-side up with a full dish of green peas alongside, so until last year the final quack had been silenced by Christmas. It was only a bid by a farmer neighbour for the future stud services of a particularly fine specimen of English duckhood that saved Sir Francis from a macabre visit to the potting-shed. The possible immorality of leaving him alone in the feminist stronghold of the henhouse led to Corluva's reprieve, and so the winter snows were printed with a double set of deltas. With the coming of spring she disappeared from the garden, and although we suspected a poacher's dirty work, Sir Francis remained surprisingly complacent in his isolation. In fact he seemed puffed up with unaccustomed pride. We were getting rather worried about Corluva until one evening our old bloodhound lumbered up and began breathing heavily into a crevice in the wood pile. A flurry of white shot out: Monitor put his stern between his legs and fled, with a wicked yellow bill snapping dangerously near a tender spot. We took advantage of the chase to investigate the nest. There sure enough were ten warm eggs. Our daily help is a natural pessimist, casting doubt upon the fertility of the clutch. She shook her head. "I've never seen Sir Francis acting like a proper gentleman." But I have attended so many clinical examples of the magic of the waterside meadows in our village that I am putting in five extra rows of peas this year.

* * *

I now have a perfect reply to philistinism. Passing from the room with the French impressionists at the Tate to the last, most modern one of the current exhibition of German painting, we stopped to examine one of the striking large canvases. It was a representation of round, oval, and irregularly shaped splashes of vivid colour and no identifiable message. My wife wondered aloud if our Peter could achieve something like it. This was overheard by a middle-aged, stocky, bearded man who observed with perfect charm: "May I respectfully suggest, Madam, that he tries."

* * *

May I intrude upon the musing of the peripatetic shuftiscopist and, with respect for the sanctity of the wondrous revelations of auscultation to the physician, suggest that we rename the stethoscope, the Accessory Oracle?

Letters to the Editor

BURNS AND SCALDS

SIR,—Your editorials are so rightly esteemed for their sense of fair play and balanced judgment that I hope you will permit one who has made a close study of burns for more than ten years to offer comment which differs somewhat from the views expressed in your leader of May 19.

That leader was, in effect, a reply to a correspondent whose unhappy experience of his wife's scalded foot treated by exposure to air had left him unconvinced of the merit of that procedure; and the leader offered guidance to others (especially general practitioners) faced with the management of common injuries of this type. But was your guidance, Sir, very helpful? You told your readers that "the modern treatment" of burns is by exposure to air, and then went on immediately to mention certain undesirable features of that method—the pain involved "may be considerable," and there is good reason to question its efficacy as a means of preventing bacterial infection of the burned surface. In this last connection you rightly reminded readers that Lowbury and his colleagues [1] had shown that, while the dried surface of the eschar remained sterile or nearly sterile, its inner surface, next to the regenerating tissues, was often heavily contaminated by pathogenic bacteria. (Actually this was observed in all of six cases investigated.) Other observations pointed in the same direction—to the more frequent infection of burns treated by exposure. These workers concluded with the fair comment: "A place still exists for both kinds of treatment, and exposure is often indicated on clinical grounds or because adequate cover with dressings is impossible" (i.e., especially in burns of the face and buttocks).

What was the practitioner confronted with the scalded foot of an old lady to conclude from all this? Would he not ask himself: "Is there no surer way of avoiding infection, and all the pain of frequent dressings, the slow healing, and the poor final result which so often follows"? Your leader, Sir, offers him as the only alternative to the exposure method "ointments or picric acid"—treatments in vogue in 1930. There is no mention whatever of penicillin cream, which is still, after ten years' experience with more than 3500 burned patients, regarded by the Birmingham workers as a most valuable agent for avoiding streptococcal infection. (Creams of some of the other antibiotics are equally valuable but very much more expensive.) Was this unique body of experience not even worthy of a passing mention? Nor the most illuminating fact that, in a carefully controlled clinical trial, Jackson et al.[2] had shown that, whereas only 1·7% of 58 burned sites (in 27 patients) acquired a streptococcal infection after the prophylactic application of penicillin cream, no less than 38% of 42 burned sites acquired such an infection in 19 patients not so treated. Surely, in view of the great importance of streptococcal infection in the burned patient, that observation was one of the most valuable signposts that has been set up in the past twenty years?

And it had particular relevance to your correspondent's scalded foot, since that is par excellence a lesion which can be effectively covered to protect it against both airborne and contact infection. (In Birmingham only 1·6% of all burns of the foot became infected by streptococci after treatment by penicillin cream and careful coverage.) After seeing some hundreds of such injuries so treated one may confidently hazard the guess that had the scalded foot of your correspondent's wife been covered generously with penicillin cream she would have had no pain at all from that time; her burn would almost certainly have escaped streptococcal infection; it would have healed in about three weeks (allowing for her age) if the injury was superficial, or it could have been grafted at an early stage with an optimal chance of success if that had been judged necessary.

Readers may well be asking: "Why did the leader not mention penicillin cream and the evidence of the Birmingham unit"? Why indeed? It appears that you had in mind the opinion of some plastic surgeons (*not* the whole Association of Plastic Surgeons) that the use of penicillin in this way entails "too great a risk" of generalised sensitivity in the patient, or of insensitivity in the bacterial population. With reference to that opinion (which was, and I think still is, unsupported by any factual evidence based on experience of a large number of patients) I would refer your readers to the very informative letter by Bull and his colleagues,[3] who stated that observation of more than 3000 inpatients at Birmingham had shown sensitivity to be "rare and transient." That is still their experience today. And perhaps I may recall, Sir, that your own wise comment [4] on this conflict of opinion was to the effect that readers who wished to arrive at the truth would choose between a clinical impression and a controlled trial. With regard to the other alleged risk of prophylactic penicillin—that it will favour the development and dissemination of organisms insensitive to that agent—Bull and his colleagues made the effective reply that this had already happened in many hospitals where prophylactic applications were not being used.

In conclusion, may I suggest that the most urgent need for the better treatment of the many burns which could be dealt with at home is of a penicillin preparation for local application which is stable at ordinary temperatures, or of another equally effective and inexpensive antibiotic. The exposure method has been on trial all over the world for seven or eight years, and most surgeons now recognise its considerable limitations. The time has come for a return to wisely directed local prophylaxis, combined, when possible, with dressing in "clean" air and other measures calculated to reduce the chances of infection. We should no longer be complacent about infection. Let us get rid of it.

Farnham Royal, Bucks. LEONARD COLEBROOK.

SIR,—The letter from your correspondent "Unconvinced" (May 19) raised several points, some of which were answered very clearly in your editorial. The difficulties in diagnosis of the depth of burns and scalds are well known: the clinical appearance on admission is often grossly misleading, and the pin-prick test demands good coöperation from the patient at a time when he is least likely to give it. It may prove possible to devise tests for burn depth by the intravenous injection of suitable dyes or radioactive isotopes. Indeed, one such dye is under investigation at this hospital. But I would suggest that an accurate history of the accident and the immediate first-aid measures employed may give a good lead as to the depth of the burn or scald.

The popular misconception that a scald is less serious than a burn is still widespread amongst both medical and lay workers. Yet our experience at the regional burns centre for Wales shows that a considerable proportion of the scalds sent to this hospital require skin-grafting. For instance, of 108 cases of domestic scalds admitted during 1955, 54% required grafting. During the same period, 118 domestic burns were treated, of which 61% needed grafting.

The types of scald that are likely to prove serious are:

(1) Those in which the boiling liquid falls on to uncovered skin—e.g., hands, forearms, legs, and neck.

1. Lowbury, E. J. C., Crockett, D. J., Jackson, D. M. *Lancet*, 1954, ii, 1151.
2. Jackson, D. M., Lowbury, E. J. C., Topley, E. *Ibid*, 1951, ii, 705.
3. Bull, F. P., Jackson, D. M., Lowbury, E. J. C., Topley, E. *Ibid*, 1954, i, 161.
4. *Ibid*, p. 298.

(2) Those in which there is considerable delay in removing clothing which has been saturated in boiling liquid. Most of these scalds occur in the region of the axilla and upper arm, or in the groin—both sites where hot liquid tends to "pool." In our survey last year we found 15 cases, all in children, in which there was definite delay in removing clothing after a scalding injury. All of these children required skin-grafting, 5 needing two, and 2 needing three, grafting operations. In all these children, woollen garments, such as cardigans and knickers, were worn at the time of the accident, and it is our impression that these knitted garments hold the heat much longer than other materials.

The importance of early removal of clothing from scalded patients is not widely appreciated, and the Ministry of Health advice note 5/54 states that "in the event of a burn or scald no attempt should be made to pull the clothes off the skin . . ." This is no doubt put forward in order to prevent further shock by rough handling of the patient, but certainly in the case of scalds retention of sodden hot clothing may cause unnecessarily deep destruction of the skin.

Plastic Surgery, Burns, and Jaw Injuries Centre, St. Lawrence Hospital, Chepstow, Mon.

MICHAEL N. TEMPEST.

RESPIRATORY INVOLVEMENT IN POLIOMYELITIS

SIR,—We welcome the discussion on the management of bulbo-respiratory complications in poliomyelitis which has taken place in your journal, and particularly the consideration given to the correct place of tracheotomy. It is timely that experience in this field should be pooled at the beginning of the poliomyelitis season as it is no longer necessary to be guided by the data collected during the Copenhagen epidemic of 1953, which was responsible for the great increase in the method in the U.K.

Dr. Scott and Dr. Knox (April 21), in an interesting discussion on their experience in transporting twelve cases of bulbo-respiratory paralysis last year, suggest that it might be better to perform tracheotomy before the journey, so that the trachea can be protected by the cuffed tube from aspiration from the pharynx, and positive-pressure respiration can be given by the same tube if necessary. Dr. Crampton Smith and Dr. Spalding (May 5) reply suggesting that for the period of transport it is better to use an *oral* cuffed tube passed under local anæsthesia and to perform the tracheotomy once the patient is "under good conditions on arrival at the final hospital." We should like to support the first part of the latter recommendation but to add that by the time the patient has reached "good conditions" one of the two major hurdles—namely, transport—is already passed, and that instead of performing a tracheotomy on arrival the resources of the hospital should be directed to avoiding this intervention if at all possible. Thus, while the oral tube is in place the patient can be prepared for its removal, and for the use of negative-pressure respiration by (*a*) emptying the stomach and lower bowel (vomiting, associated with restlessness, is probably the other major hurdle), (*b*) effective sedation, (*c*) transfer to a cabinet respirator to be maintained in a steep head-down tilt after removal of the tube, and (*d*) the establishment of effective replacement therapy. If necessary the lungs can be cleared by direct vision with a bronchoscope, and of course effective suction must be constantly available to keep the pharynx clear.

It has been our unfortunate lot for the past eighteen months to observe what a tragic complication a tracheotomy can be in a condition such as poliomyelitis, which may leave behind severe residual respiratory paralysis. Such patients have virtually no cough, and chronic pulmonary infection appears to be an inevitable consequence of the stoma. This infection reduces both the effective ventilation obtained by the residual respiratory power, and also the area of healthy lung tissue available for respiratory exchange. Consequently the recovery of spontaneous respiration is severely handicapped, and, so long as the stoma and therefore the chronic infection persist, weaning from aid may be impossible. Yet closure of the stoma is fraught with danger because of the chronic infection in the absence of a useful vital capacity and effective cough. The patient is, in fact, trapped in a vicious circle; and the period of rehabilitation is either grossly prolonged by months or even years, or closure, and consequently rehabilitation, may have to be abandoned altogether, with the result that the patient may be condemned to permanent stay in hospital for the rest of his days. There are, in fact, a number of cases with severe respiratory paralysis now living in relative happiness at home for whom such a solution would have been impossible had a tracheotomy been performed in the acute stage; and some of these cases would have been in real danger of this complication had they fallen into less conservative hands at that time.

Obviously, the decision to perform a tracheotomy in a particular case must rest with the man on the spot. Our object in writing is simply to pass on to him the product of our own experience in managing such cases of severe respiratory paralysis complicated by stomata in the recovery period, so that he may take our viewpoint into consideration when making his decision. In practice, we believe that the suggestion made by Dr. Crampton Smith and Dr. Spalding—that the danger period of transport should be tided over by means of an oral endotracheal tube—should be extended to tide over the rest of the acute episode, and that both "prophylactic" tracheotomy and tracheotomy for the sake of administering artificial respiration by positive pressure should be almost limited to patients who fall ill beyond the reach of full hospital facilities and thus have mainly a "geographical" indication.

The time for which an oral tube can be left in situ is still, we understand, sub judice. Figures varying from eight to forty-eight hours or more have been cited to us by different authorities. Certainly in one case a duration of forty-eight hours was risked with impunity. The danger period in poliomyelitis is fortunately often relatively short, and for this reason one should be the more reluctant to superimpose a complication which may have such lasting serious consequences if there is any hope that it can be avoided.

Nuffield Orthopædic Centre, Oxford.

J. TRUETA
M. AGERHOLM.

PARAPLEGIA FOLLOWING SPINAL ANÆSTHESIA

SIR,—Dr. Payne and Dr. Bergentz (May 12) do well to draw attention once more to the well-established clinical fact that paraplegia ensuing upon spinal anæsthesia may appear only several days after this procedure, and may then progress slowly for a further period of days or even weeks.

Their case exemplifies also another established fact—that the immersion of ampoules of spinal anæsthetic in toxic solutions for purposes of sterilisation is by no means a constant factor in recorded cases of neurological complications after spinal anæsthesia.

The only factor common to all these cases is the use of a spinal anæsthetic.

The relevant literature makes it clear that the patient has often severed his ephemeral connection with the anæsthetist before his neurological syndromes—particularly the less severe ones—develop. Therefore what the anæsthetist does not hear about may nevertheless have happened.

Sir Robert Macintosh returns from Africa, not "with something new," but with the old story that what he has not heard about has not happened. In his letter last week he cites again his single experience of the ampoule contaminated through invisible cracks by the coloured fluid in

which it was immersed, as though this episode had a universal validity for every case of neurological disaster after spinal anæsthesia. He assures us also that he has first-hand information (of some presumably unpublished experiments) that such a carbolic solution as was allegedly responsible for paraplegia in two cases recently the subject of a High Court action, when injected intrathecally into "higher animals," produces the lesions believed to exist in these two cases.

He does not give us any details of the clinical course or nature of the symptoms in the experiments he refers to, and without this information his reference is meaningless. The point is important since carbolic acid is a corrosive poison with immediate destructive effects upon living tissues. That, injected intrathecally, it should lead not to immediate and striking symptoms, but only—as is characteristic of paraplegia following spinal anæsthesia—to a symptom-free latent period of hours or days and then to a subacutely developing syndrome over further days or even weeks, is something I find no grounds for believing.

Yet in the cases referred to, this is what the court was invited to believe, and also that it was negligent in an anæsthetist who, using a then accepted method of sterilising his ampoules, did not see in them hypothetical and invisible cracks.

In the event, the court accepted the first plea, which was incompatible only with toxicology, but rejected the second which was contrary to common sense.

We must regret that Sir Robert Macintosh still seeks to hide the very serious nature of this problem in his invisible cracks, which in fact do not hide it, for all the evidence indicates that there is some special risk inherent in spinal anæsthesia.

To maintain there is none such, means that whenever a neurological disaster follows spinal anæsthesia—and there is no reason to think that they will not recur from time to time—the unfortunate anæsthetist involved lies open to a charge of negligence. In the present attitude of the public, a scapegoat will be sought, and if it be authoritatively held that the method properly used is without special risk, patients and anæsthetists will be exposed to dangers from which they should be protected.

Anæsthetists might well give themselves to some research upon this matter, since a naïve optimism is not a substitute for knowledge.

London, W.1. F. M. R. WALSHE.

ACUTE AND LATENT PORPHYRIA

SIR,—We can support the opinion of Dr. Whittaker and Mr. Whitehead, in their interesting paper of April 28, that acute porphyria is more common than is generally realised. We have encountered five new cases [1] in two years from a population of approximately 300,000, and almost certainly many remain undiagnosed.

One of our patients, with paralysis, had taken butobarbitone ('Soneryl') for the first time just before the onset of the illness and she was inadvertently given the same drug again later; the abdominal pain returned for a day or so, but there were no further neurological developments and she recovered.

As regards the pathogenesis we suggested that there seems to be a sudden and probably widespread arterial disturbance—perhaps a kind of allergic vasculitis and curiously reminiscent in some respects of polyarteritis nodosa—operating in those with an inherited error of pyrrole metabolism; drugs precipitate this in some cases but in many no causal factor can be found.

C. E. ASTLEY
Middlesbrough. A. ALUN WILLIAMS.

SIR,—We agree with Dr. Pathy (May 12) that barbiturates can occasionally precipitate an attack of acute porphyria; one patient under our care was given barbiturate by her practitioner for the relief of insomnia and this induced an attack of acute porphyria. We regret that this point was not made clear in our article.

Our special interest in the relationship between the neurological complications of acute porphyria and the administration of barbiturates arose from a personal communication from Dr. A. Goldberg, who drew our attention to Waldenström's [1] original observation that barbiturates might precipitate neurological manifestations in patients who might otherwise suffer only from the abdominal symptoms of the disease. Goldberg and Rimington [2] develop this theory experimentally, and we trust that they will soon elucidate further the rôle of barbiturates in acute and latent porphyria.

S. R. F. WHITTAKER
Warwick Hospital. T. P. WHITEHEAD.

1. Astley, C. E., Williams, A. A. *Univ. Leeds med. J.* 1954, **3**, 116.

ALDOSTERONE

SIR,—We read your annotation last week with great interest. There can be no disagreement with the main conclusion that at present diagnosis and management of primary aldosteronism must rest on clinical findings and metabolic disturbances without depending on the measurement of the hormone in urine or blood. However, in the annotation there are certain inaccuracies of fact and emphasis which we feel, if ignored, would tend to delay understanding of the condition.

In our experience, the yield of free aldosterone from urine is increased 10 to 30 fold by hydrolysis at pH 1, not threefold as you quote one of us as saying.

The main problem in the study of cases of primary aldosteronism would appear to be that in two examples investigated in detail—that reported by Dr. Chalmers and his colleagues (Jan. 21) and that described by Dr. M. D. Milne at the Royal Society of Medicine on April 25—the urinary excretion of aldosterone, as measured by our group and Dr. G. T. Mills respectively, although raised above the normal mean value is almost within the range of values for twenty healthy subjects. In contrast, certain cases of secondary aldosteronism excrete the hormone in much greater amounts. The following possible reasons for this were investigated in the case reported by Chalmers et al.:

1. That renal excretion or mode of conjugation of the hormone was abnormal. However, the concentration of free compound in blood and the ratio of free to conjugated aldosterone in urine was not found to be outside the normal range. This explanation, therefore, seems unlikely, as does that advanced in your annotation—that the conjugate may not have been hydrolysed. This latter hypothesis would imply the presence of an inhibitor of pH 1 hydrolysis in the urine of cases of primary aldosteronism. There is no evidence for this, and in any case the values of free aldosterone in blood and urine were not greatly raised.

2. That the condition was due to another adrenal compound. However, the urine from the case of Chalmers et al. was extensively fractioned by partition column chromatography under conditions which would lead to little loss of most neutral steroids. The fractions were then bio-assayed with respect to their effect on the urinary Na/K or Na or K excretion of adrenalectomised rats. No activity was found other than in the fractions containing aldosterone. There is thus as yet no evidence for the existence of such a corticoid.

3. A recent publication by Luetscher,[3] which is supported by the results of the analysis of rat adrenal venous blood by Singer and Stack-Dunne,[4] reports that normal humans depleted of potassium, with plasma-potassium concentrations of 1·5–2·5 m.eq. per litre, show markedly depressed excretion of aldosterone. This raises the question as to whether subjects with normal intake and plasma values of electrolytes are the appropriate controls for cases of primary aldosteronism. These results indicate that cases of potassium-losing nephritis without adrenal tumour showing low potassium and normal

1. Waldenström, J. *Acta Psychiat., Kbh.* 1939, **14**, 375.
2. Goldberg, A., Rimington, C. *Proc. roy. Soc.* B. 1955, **143**, 257.
3. Luetscher, J. A. jun., Curtis, R. H. *Fed. Proc.* 1955, **14**, 746.
4. Singer, B., Stack-Dunne, M. J. *Endocrinology*, 1955, **12**, 130.

or raised plasma-sodium values might excrete abnormally low amounts of aldosterone. In that case slightly raised excretion of aldosterone under these electrolyte conditions may be diagnostic for the presence of tumour. Thus the values in the case of Chalmers et al., as measured some time before the operation, could be explained by a combination of aldosterone secretion by a tumour relatively autonomous to electrolyte control together with that from normal adrenal tissue which is depressed by the prevailing state of potassium depletion. This depletion would have given rise to a low excretion of aldosterone for a subject with a totally normal gland. This could also explain the great decrease in aldosterone excretion after removal of the tumour down to values found in totally adrenalectomised patients, whereas the cortisol values are only halved and presumably one gland remains intact. In our opinion this speculation, which can be investigated experimentally, would appear to be the most fruitful approach to the problem at the present time.

It should be emphasised that this suggested reduction in aldosterone excretion in potassium-losing nephritis without tumour would not be due to nephropathy caused by hypokalæmia as reported in your annotation, but to a selective effect of the mineral environment on the adrenal secretion of aldosterone.

O. GARROD
S. A. SIMPSON
J. F. TAIT.

Middlesex Hospital Medical School, London, W.1.

COMPOSITION OF FLOUR

SIR,—According to the Panel on Composition and Nutritive Value of Flour, whose report you summarised last week, the millers and bakers claim "that if people can obtain only bread made from 80%-extraction flour they may eat less bread and more of other manufactured foods which may not be so nourishing." It does not appear to have occurred to the industry that it would be better for the public health to engage in proper milling and baking: that is, milling to leave in all the germ and resist its subsequent sterilisation by whatever process has superseded agene, while in baking such things as anti-staling agents and all chemicals should be left out so that bread is only flour and yeast. Then English bread would again have a pleasant taste and substance and a crisp crust, instead of being the worst bread gastronomically in Europe. The consumption of bread would improve as it gave pleasure to the public; dividends would improve and health would improve.

London, W.1. FRANKLIN BICKNELL.

FATS AND DISEASE

SIR,—In spite of forty-three years of single-minded experimentation the dietary theory of atherogenesis has remained pure speculation. All that has been shown is that the levels of certain serum-lipid fractions are raised in many cases of atheromatosis; it is a far cry from this to a causal relationship. These increased levels may mean no more than that atherosclerotic plaques contain lipids—hardly a very striking contribution to knowledge.

Even if it could be shown that these abnormal blood levels are indeed an important causal factor in human atherogenesis, it would still remain to be proved that they were due to feeding habits. Numerous bodily reactions affect the blood-lipid balance, each one of which might be inculpated with equal, and most with better, justification. Myocardial infarction itself is one of these many causes of lipæmia [1]—a fact which illustrates strikingly the weakness of the dietary theory.

The war-time decline in the incidence of coronary disease is cited in support of this theory, as if a low fat content were the only characteristic of a war-time diet. With much better justification one might speculate about the hypotensive effect of a low-calorie and low-protein diet on the population and on its obese contingent in particular. These effects are well attested, as is the atherogenic effect of hypertension.

Do general practitioners really eat twice as many eggs as their consultant colleagues? [2] Do bus conductors refuse to share sunflower cakes with their drivers? [3] In spite of widespread publicity nothing has yet come to light to suggest that diet plays an important part in any but a small fraction of the people who come to grief as the result of atherosclerosis.

Edinburgh. ERICH GEIRINGER.

TREATMENT OF SUPERFICIAL SEPSIS

SIR,—Dr. Bauwens and his colleagues are to be congratulated on their valuable and interesting paper last week. The general adoption of the methods they describe, however, would lay an additional burden on already overworked departments of physiotherapy. Any evidence concerning the efficacy of physical methods as a routine measure in the treatment of minor sepsis should, therefore, be examined with care.

It is for this reason that I venture to suggest that their control and treated groups are not strictly comparable. The wounds in the treated groups were dressed with tulle gras, or tulle gras and aureomycin powder, while in the control group 1/1000 proflavine was applied. The use of a different dressing, whatever its nature, for the control group would alone appear to detract from the validity of their findings. In addition there is evidence that proflavine in dilutions as high as 1/120,000 exerts an inhibitory effect on the growth of fibroblasts and macrophages.[4] It is conceivable, therefore, that the use of proflavine, particularly its repeated use, may have delayed the healing-time in the control group.

While the methods advocated are of undoubted value in cases of minor sepsis which fail to respond to accepted measures, it is doubtful, on available evidence, whether they should be used in every case.

St. George's Hospital, London, S.W.1. MICHAEL E. FEARNLEY.

TREATMENT OF TETANUS

SIR,—Professor Lassen and his colleagues (April 28) describe two cases of severe tetanus in which protracted administration of 50% nitrous oxide and 50% oxygen led to fatal aplastic anæmia, caused, they suggest, by the nitrous oxide.

Is it not possible that the oxygen, rather than the nitrous oxide, was the cause? It is known that anoxia is the usual stimulus to red-cell formation, and living at high altitudes leads to polycythæmia in compensation for the reduced partial pressure of oxygen. Conversely, with high pressures of oxygen the formation of red cells is depressed.[5] With administration of 50% nitrous oxide and 50% oxygen, the partial pressure in the alveoli is raised some three and a half times, and it is possible that over a period of days this partial pressure of oxygen removes the natural stimulus of anoxia to red-cell formation. The agranulocytosis in the cases described by Professor Lassen and his colleagues would not rule out this thesis, if in fact the hæmocytoblast is the common precursor of both the red cell and the granulocyte.

A further trial would seem to be indicated, using 20% oxygen with 80% nitrous oxide or, better still (since only one factor would be varied), 20% oxygen, 30% nitrogen, and 50% nitrous oxide.

Queen Alexandra Military Hospital, Millbank, London, S.W.1. CHARLES SANDERS.

1. Adlersberg, D., Drachman, L. E., Schaefer, S. R. *Circulation*, 1951, **4**, 465.
2. Morris, J. N., Heady, J. A., Barley, R. G. *Brit. med. J.* 1952, i, 503.
3. Morris, J. N., Heady, J. A., Raffle, P. A. B., Roberts, C. G., Parks, J. W. *Lancet*, 1953, ii, 1053.
4. Jacoby, F., Medawar, P. B., Wilmer, E. N. *Brit. med. J.* 1941, ii, 149.
5. Wright, S. Applied Physiology. London, 1952; p. 194.

PERFORATED ACUTE AND CHRONIC PEPTIC ULCER

SIR,—We would like to reply to some of the points raised by your correspondents on this subject. Like Mr. Moore (April 28) we practise vigorous resuscitation measures in patients with grave peritonitis and include among these drainage of the peritoneal cavity at the earliest practicable moment. Mr. Moore, however, doubts our description of 7 patients as "moribund" before treatment and implies that more vigorous management might have saved some of them. Mr. Gilmour (May 5) considers that consecutive admissions of cases of perforation to his beds on his receiving day constitute an unselected series of cases comparable to our own. We therefore put forward brief descriptions of our 7 moribund cases to illustrate our attitude to these problems.

1. Man, aged 67: perforated duodenal ulcer; blood-pressure unrecordable on admission. Dextran and blood-transfusion; peritoneum drained under local anæsthetic. Died within 24 hours of admission.

2. Man, aged 63: perforated duodenal ulcer; very emaciated; chronic bronchitis, œdema of ankles, and bedsores. Immediate response was good but collapsed and died 16 hours after admission.

3. Woman, aged 77: perforated gastric ulcer; blind and deaf; bedridden for 15 years. Became unconscious soon after admission and made no response to treatment. Necropsy showed pulmonary embolus in addition to peritonitis.

4. Man, aged 83: perforated carcinoma of the stomach with secondaries.

The next three patients were all admitted to the medical wards:

5. Man, aged 74: admitted with uræmia and bleeding duodenal ulcer; perforated after admission. Perforation did well with conservative treatment but patient died after five days from uræmia, due to pyelonephritis in only functioning kidney.

6. Man, aged 69: admitted with severe bleeding from duodenal ulcer and gross anæmia. While he was being resuscitated the ulcer perforated. In spite of vigorous treatment he never recovered sufficiently to undergo operation.

7. Man, aged 77: admitted as a case of collapse and died in a few hours. Diagnosis of perforated duodenal ulcer made at necropsy.

We hope that Mr. Moore will admit that "moribund" is not an exaggerated description of these cases. We hope that Mr. Gilmour will agree that our mortality figures include more deaths than those in "cases admitted to the beds of a surgeon on his receiving day." The last 3 cases would not have been included on Mr. Gilmour's definition of an unselected series: nor would 2 at least have been likely to appear under the main heading of "perforations" in the lists of a hospital records officer. We find a great difference between mortality in that group of cases which find admission to surgical wards and the total admissions to the hospital collected *as the cases arise* as a matter of special interest. Avery Jones found the same discrepancy, with less than half the mortality in the operated cases.

Mr. Downie (May 19) asks what proof exists that our 200 cases were in fact perforations. 75% of the cases showed gas under the diaphragm on radiography, and we have regarded that as proof. The incidence of intra-peritoneal gas is roughly the same as in published figures of operated series where the diagnosis was confirmed at operation. We feel, therefore, that our clinical diagnoses in the 25% without gas are not far wrong, apart from the collected group of errors we have described. There is, of course, no proof, but cases have only been accepted as perforations with the full distinctive clinical picture: the series does not include doubtful "leaks" or painful exacerbations of the ulcer. The question is, of course, an academic one. Our claim is that within the conditions set out in our paper the patients whom we diagnose as suffering from perforated ulcers do remarkably well if they have only a short history of dyspepsia, but not well enough—like the sutured cases in other hospitals—if they have suffered from indigestion for years.

We do not wish to enter into a discussion on the place of immediate partial gastrectomy in the treatment of perforations. Our experience teaches us that no sort of operation has any place in perforated *acute* ulcer, but that neither suture nor aspiration is completely satisfactory, in the long view, in cases of perforated *chronic* ulcer. Where it is feasible, we believe partial gastrectomy to be the treatment of choice for perforated chronic ulcer. Nevertheless, if the condition of the patient precludes partial gastrectomy, operation merely to close the perforation offers no advantages where the stomach can be kept empty by aspiration.

HERMON TAYLOR
London Hospital, E.1. RICHARD P. WARREN.

SMOKING

SIR,—In connection with cancer of the lung and cigarette-smoking there is much talk of alleged "carcinogenic factors" in tobacco smoke. Research is going on in the hope of finding such factors, and—presumably—eliminating them from the tobacco so that people can go on smoking (and coughing their heads off) immune from the danger of bronchial carcinoma.

Perhaps the *coughing* is the clue to the riddle? The heavy cigarette-smoker who presents with cancer of the lung has had "a smoker's cough" for years—and an inflamed, irritated respiratory tract, the lining cells of which are under a constant stimulus to replace themselves with undamaged cells. It is not to be wondered at if some fine day the replacement process shows signs of wear and tear and carcinoma cells are produced.

If this theory of irritation is correct the search for presumed "carcinogenic factors" in tobacco is superfluous. Cancer of the lung could result equally from smoking brown paper or cabbage leaves.

In pipe-smoking there is conspicuously less irritation of the throat, less coughing, and less carcinoma of the bronchus.

London, W.1. J. A. BRUCE YOUNG.

HOME CONFINEMENT

SIR,—I should like to mention another argument in favour of home confinement, or better still return home after completion of labour as in the scheme suggested by Dr. Sluglett and Dr. Walker (May 12). Much has recently been written about the effects of maternal deprivation on young children.[1] A young child needs to have and to *feel it has* persistent parental affection and protection to give it emotional security.[2] How disturbing it must be for the firstborn to be separated from his mother while she goes into maternity hospital and on her return to be presented with a mewling infant who monopolises much of her time.

It appears that most children survive the trauma with little reaction except jealousy of the newcomer and "difficult" behaviour, but it is conceivable that harm might be done and that from a mental-health point of view the increasing number of hospital confinements may not be a desirable cultural pattern.

Cardiff. JULIA FOURMAN.

SIR,—I am sure that all G.P. obstetricians will welcome the inquiry into the maternity services which has been set up as a result of the findings of the Guillebaud Committee's report and will await the emergence of a comprehensive and unified midwifery service with patience.

1. Bowlby, J. Maternal Care and Mental Health. Geneva, 1951.
2. Edelston, H. Earliest Stages of Delinquency. Edinburgh, 1952.

As a G.P. obstetrician in the London area I can only hope that the county authorities have little or no part to play in the new organisation. At present the antenatal and postnatal clinics in my district are staffed by L.C.C. medical officers, and their sole duties in the maternity services are those of antenatal and postnatal care; they are completely divorced from all other aspects of midwifery. There appears to be no liaison between the clinic doctor and the G.P. obstetrician. I cannot recall receiving any communication from the clinic doctors during the last ten years, although I undertake the care of many midwifery cases.

While I am certain that these medical officers give care of the highest order, I am equally certain that it is not right for this vital part of the service to be so cut off from the actual labour and puerperium, and conversely it is equally wrong that the G.P. obstetrician should have to treat emergencies in the mother's home at all hours of the day and night despite the fact that he is not considered to exist during the antenatal period.

It seems to me that the district midwives, the G.P. obstetricians, and the obstetric hospitals in the area should be responsible between them for all midwifery in that area, both hospital and domiciliary. They could form a team in the real sense of the word, and in this team there would be no place for the splendid isolation of the local health authority.

I realise that the local health authorities employ the district midwives and health visitors and others, but they, too, could come under the unified control and be part of the team.

London, S.W.11. IAN SAMUEL.

RHESUS (D) FACTOR IN SARCOIDOSIS

SIR,—Dr. Cudkowicz has reported (April 21) that of 32 cases of suspected sarcoidosis 21 (66%) had rhesus (D) negative blood. He suggested that a larger series should be analysed. I have investigated this point in 80 cases of clinical sarcoidosis at King's College Hospital. The results are as follows:

Rh (D) factor		*ABO group*			
Pos.	*Neg.*	*A*	*B*	*AB*	*O*
68 (85%)	12 (15%)	36 (45%)	6 (7·5%)	4 (5%)	34 (42·5%)

All but 2 of the 80 cases had pulmonary and/or hilar-node involvement.

Thus the prevalence of Rh (D) negative blood in our 80 patients was 15%. This figure is in accordance with the prevalence in the general population and is at variance with that found by Dr. Cudkowicz.

In my opinion Rh (D) negative blood has the same prevalence in patients with sarcoidosis as in the general population.

King's College Hospital, London, S.E.5. H. C. SMELLIE.

ANÆSTHESIA IN OBSTETRICS

SIR,—Dr. Coleman and Dr. Day (May 19) are to be commended for drawing our attention to the complications due to aspiration of stomach contents during obstetric anæsthesia. They have obviously anæsthetised their patients with great skill and care; and their results are due to this rather than to the technique they adopt, which courts the very dangers they seek to avoid.

By their method Dr. Coleman and Dr. Day steer clear of the Scylla of vomiting, but in so doing head straight for the whirling Charybdis of regurgitation. For, if the stomach be full, the omission of the passage of an œsophageal tube before giving a paralysing dose of relaxant, and inflating the lungs, however gently, is flirting with disaster. This danger of regurgitation overcome, only a fickle laryngoscope bulb and pious hopes of a normal epiglottis stand between easy intubation and those few moments of anoxia that may mean all the difference between life and death to the fœtus.

We all pass through the phase of using large doses of relaxants and universal intubation; but where two lives are at stake, surely would it not be better to ensure that one person at least is breathing spontaneously? To say that the anæsthetic problem involved is similar to that in a case of intestinal obstruction is incorrect, for full abdominal relaxation is needed for the latter, whereas even for a cæsarean section only very moderate relaxation is sufficient. We must not be so blinded by our magic drugs and chromium-plated gadgets that we fail to recognise the essential requirements of our partners the surgeons.

I have lately described a very simple and safe general-anæsthetic technique that I have found most satisfactory for all obstetric cases.[1] Alternatively, as far as forceps deliveries are concerned, there is much to recommend caudal or (dare I mention it?) low spinal anæsthesia.

Gravesend and North Kent Hospital. PAUL AZZOPARDI.

SIR,—Dr. Coleman and Dr. Day have done a great service in again drawing attention to the dangers of vomiting during the administration of anæsthesia for obstetric operations. The method they advocate is doubtless safe in their capable hands, but I feel that attention should be drawn to the feeling that many anæsthetists have about the danger of giving any relaxant and especially succinylcholine in a case where the stomach may be full.

They say ". . . attempting to pass a Ryle's or œsophageal tube on a woman in labour increases her fear and distress." This may be so, but the remark would apply equally to a case of intestinal obstruction or ileus. Would they agree to omitting the passage of such a tube in these cases? I feel that any woman in labour must be treated as a potential case of ileus, and a full stomach anticipated even if no food has been taken for many hours. Surely the passage of a large-bore Ryle's tube should be a routine in all such cases?

It is possible to intubate a patient harmlessly without the use of a relaxant. It was done before relaxants were introduced into anæsthetic practice, and I believe should be done in any case where vomiting is anticipated.

Worthing. F. R. GUSTERSON.

SIR,—Great attention is being paid to this subject at present, and endotracheal intubation with a cuffed tube is often advocated as a protection against inhalation of gastric contents. The relative safety of different methods of producing suitable conditions for endotracheal intubation are still sub judice, and even experienced anæsthetists sometimes cannot perform the intubation itself as rapidly as they would like. Moreover techniques safe in hospital practice may be dangerous outside hospital.

If it is considered that general anæsthesia with no artificial airway, except perhaps a nasopharyngeal tube, is hazardous, the cuffed gastric tube described by Fisher[2] might be of value. This is a small stomach-tube with an inflatable balloon situated distally. After this end has been passed into the stomach the balloon is inflated and drawn firmly against the cardiac orifice, thus preventing reflux of stomach contents. Anæsthesia is then induced.

This technique is simple. Patients who will not tolerate attempts to pass the tube will probably empty their own stomachs by vomiting during this time. It is unpleasant for the patient, but some anæsthetic techniques that do not proceed without a hitch are unpleasant for the fœtus as well as the mother.

It would be interesting to know what experiences practitioners have had of this method.

St. Albans. J. W. R. MCINTYRE.

1. *Brit. med. J.* May 19, 1956, p. 1171.
2. Fisher, C. W. *Anesthesiology*, 1953, **14**, 506.

Obituary

JOHN DEMPSTER FRASER

T.D., M.B. Glasg., F.R.F.P.S., D.O.M.S.

Dr. J. D. Fraser, who died while he was giving expert evidence in court on May 21, had been surgeon to the Glasgow Eye Infirmary for only a short time, but it was long enough for him to win the friendship of his colleagues and the admiration and respect of his patients. He was born in 1913, and educated at Hillhead High School and the University of Glasgow. After graduating M.B. with honours in 1936, he held resident appointments under Sir John McNee, Prof. A. J. Ballantyne, and Mr. Roy Young. His postgraduate training was interrupted when he was mobilised as a regimental medical officer to the 6th Battalion of the Highland Light Infantry, but in December, 1939, he was posted to the China Command as an ophthalmic specialist. As a prisoner-of-war in Hong-Kong he was allowed to continue his work as the ophthalmic specialist to the British Military Hospital until the end of hostilities. For his war service he was mentioned in despatches, and in 1946 he read a paper to the Ophthalmological Society of the United Kingdom on the ocular manifestations associated with malnutrition, based upon his personal observations carried out in the military internment camps in Hong-Kong.

After the war he resumed his work as a clinical assistant in the Glasgow Eye Infirmary and in the university eye department at the Western Infirmary. When the Ophthalmological Society of the United Kingdom met in Glasgow under the presidency of Professor Ballantyne, Fraser acted as local secretary and impressed the members by his enthusiasm and efficiency. His flair for this kind of work developed, and he became the Glasgow secretary of the Scottish Ophthalmological Club. His interests within the specialty lay in pathology and neurology. For ten years he worked as ophthalmologist to the neurosurgical unit at Killearn Hospital.

"In that position," writes J. S., "he gained an authoritative knowledge of the neurology of the eye which can rarely have been equalled by one so young. Not only the quality of his advice but also the confidence with which he gave it made his neurological colleagues rely on him to an ever greater extent. Although the number of patients seen by him in consultation grew week by week not only did he investigate them all most carefully but he got to know each patient as a human being with a job and a family. Weeks and months later he might recall the details of an optic fundus and remember where the man lived and worked and how many children he had. We shall miss his counsel, his human warmth, his great practical common sense, and his humour."

As W. J. B. R. says, "his loss is a most serious one not only to Glasgow and the West of Scotland but to a wider medical public which was beginning to appreciate his calibre. He spoke well and with assurance at a meeting in London the month before he died. His work was of the highest quality and he possessed great manual dexterity."

Dr. Fraser is survived by his wife, a daughter, and a son.

GUSTAV HERRNHEISER

M.D. Prague

Dr. Herrnheiser, consultant radiologist to the Connaught Hospital, London, and a former professor of the German University of Prague, died on May 13.

He was born in 1890 in Prague, and studied medicine at the German University there, and at Munich. After graduating M.D. in 1914 he spent seven years in postgraduate work in Prague, at the morbid anatomy department under Ghon and at the department of internal medicine under Jaksch. In 1920 he joined the radiological department under Holzknecht in Vienna. Five years later he returned to Prague as Dozent in radiology to the German University. In 1931 he was appointed to the chair of radiology. His early work included investigations on the anatomy of the blood-vessels of the lung, but later his main interest was in radiological diagnosis of diseases of the chest and gastro-intestinal tract.

In 1939 political events forced him to leave Prague, where he had lived and worked for the best part of his life, and where he had built up the X-ray department at the university clinic. He went first to Palestine, where he became chief radiologist to the Hadassah Hospital, Tel-Aviv, an appointment which he held until 1942, when he left for Egypt to become chief radiologist to the King Fuad Hospital and the Jewish Hospital in Alexandria. He settled in this country in 1948. "For the first time, after many years, he felt at peace again," writes M. E. G., "and England became a second home to him; one which he loved and where he was happy once more. He soon became active again, and in a very short time made many new friends. He was respected by all who met him, and realised his qualities, his sincerity and deep knowledge, his innate modesty and unceasing search for the truth."

Professor Herrnheiser leaves a wife and two daughters.

Dr. J. M. D. OLMSTED, a former professor of physiology at the universities of Toronto and California, has died at the age of 70. He shared in the research which led to the discovery of insulin, and he was a co-editor of several editions of *Macleod's Physiology in Modern Medicine*. He was also interested in the history of his specialty and had published monographs on Claude Bernard (1938) and on François Magendie (1945).

Diary of the Week

JUNE 3 TO 9

Monday, 4th

POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.12
4 P.M. Dr. W. Ritchie Russell: Spastic Paraplegia.

INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY, Chelsea Hospital for Women, Dovehouse Street, S.W.3
4.30 P.M. Mr. Kenneth Bowes: Intersex.

INSTITUTE OF NEUROLOGY, The National Hospital, Queen Square, W.C.1
5 P.M. Dr. Ludo van Bogaert (Belgium): Genetic Acro-osteolysis and Necrosing Acropathy in Neurology.

Tuesday, 5th

THE WRIGHT-FLEMING INSTITUTE OF MICROBIOLOGY, St. Mary's Hospital Medical School, W.2
5 P.M. Prof. C. H. Stuart-Harris: Recent Studies in Acute Respiratory Disease. (Almroth Wright lecture.)

INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5.30 P.M. Dr. R. H. Meara: Xanthomatosis.

Wednesday, 6th

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
5.15 P.M. *History of Medicine.* Sir Zachary Cope: Florence Nightingale and the Doctors. (Presidential address.)

POSTGRADUATE MEDICAL SCHOOL OF LONDON
2 P.M. Prof. G. L. Montgomery: Morbid Anatomy of Coronary-artery Disease.

INSTITUTE OF DISEASES OF THE CHEST, Brompton, S.W.3
5 P.M. Mr. T. Holmes Sellors: Congenital Heart-disease.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. R. W. Riddell: Differential Diagnosis of Mycotic Infections.

INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
NOON. (Queen Charlotte's Hospital, Goldhawk Road, W.6.) Mr. A. L. Gunn: The Use of Kielland's Forceps.

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH
8.30 P.M. (Royal College of Surgeons, 18, Nicolson Street, Edinburgh.) Mr. Douglas L. Savill: The Painful Foot.

Thursday, 7th

ROYAL SOCIETY OF MEDICINE
5 P.M. *United Services.* Surgeon Commander J. W. L. Crosfill Drowning.

POSTGRADUATE MEDICAL SCHOOL OF LONDON
4 P.M. Dr. Paul Wood: Diagnosis and Treatment of Spastic Paraplegia.

SOCIETY FOR ENDOCRINOLOGY
5.30 P.M. (University College, Gower Street, W.C.1.) Dr. C. N. H. Long (Yale University): Experimental Obesity.

UNIVERSITY OF ST. ANDREWS
5 P.M. (Queen's College, Small's Wynd, Dundee.) Sir Harry Platt: The Backache-sciatica Problem.

Friday, 8th

POSTGRADUATE MEDICAL SCHOOL OF LONDON
10 A.M. Mr. Norman Capener: Tumours of the Bony Pelvic Wall.
2 P.M. Mr. K. Morris (Melbourne): Mediastinal Goitre.
4 P.M. Dr. Russell Fraser: Metabolic Bone Disease.

ST. MARY'S HOSPITAL MEDICAL SCHOOL, Paddington, W.2
5 P.M. Mr. J. B. Blaikley: Impression of Obstetrics and Gynæcology in the United States.

INSTITUTE OF DISEASES OF THE CHEST
3.30 P.M. Prof. H. J. Ustvedt (Oslo): Usual and Unusual Reactions to B.C.G. Inoculation.

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, W.C.1
3.30 P.M. Mr. A. R. Dingley: Hoarseness.

Notes and News

FEEDING IN MENTAL HOSPITALS

A CONFERENCE on feeding in mental hospitals was convened by King Edward's Hospital Fund for London on May 2, under the chairmanship of Prof. S. J. COWELL.

Dr. T. P. REES emphasised the psychological value of giving patients in mental hospitals a say in the choice of their food. This is achieved at Warlingham Park Hospital by means of weekly meetings between the catering officer and representatives of patients, one from each ward as far as possible.

Miss J. GUTTERY spoke of the need for a proper balance in menu planning. In her experience the dietary often has too much starch and not enough protein, and insufficient attention is paid to balancing of flavours between sharp and bland, appearance and colour, and consistency. She urged that breakfasts should always include a protein dish, and that marmalade should be provided daily with breakfast and jam with tea. Her conclusion, which was well received, was that food should be purchased according to the requirements of the menu, instead of the menu being fitted to the food purchased.

Mr. G. J. STORMONT drew attention to the disproportionate ratio of boiling-pans and steaming and draw-plate ovens to boiling-tops, salamanders, fish-fryers, and roasting-ovens in the equipment of the average mental-hospital kitchen, which of course adversely affects the standard of menu. He went on to emphasise the need for correct layout and proper balance of the preparation, cooking, and service areas in the main kitchen in mental hospitals, which, owing to the numbers that have to be fed, are usually so large as to make proper supervision difficult, if not impossible. A higher standard of cooking would undoubtedly be achieved if all meals were prepared in ward and villa kitchens; but the problem of staffing control would be insuperable in present conditions, and in his view the best compromise would be a kitchen with a maximum output of 1000 meals which would afford scope for sectionalisation and which, under the present Whitley scale, would be large enough for the employment of adequately qualified staff.

Mr. W. G. WILSON, speaking mainly in the light of his experience in a mental-deficiency hospital, advocated the use of insulated food-boxes in preference to electrically heated food-trolleys, for the transport of food between kitchen and wards. He argued that, intelligently used, insulated food-boxes retain heat effectively and at the same time are much cheaper to operate. For towing Mr. Wilson favoured electric trucks as cleaner, steadier, and more manœuverable than petrol-driven vehicles.

Miss E. H. JOHNS said that even today there are many difficulties in providing a satisfactory meal service, such as badly equipped ward kitchens, inadequate crockery and cutlery, and, above all, lack of staff. Miss Johns urged that priority be given to the upgrading of ward kitchens, installation of refrigerators and modern tea-making equipment, redecoration and refurnishing of dining-room areas, and the provision of more domestic help. This last is perhaps the greatest need, in order to reduce the atmosphere of haste which prevails in so many large wards where two or three nurses have to look after seventy or eighty patients, many of whom may require individual attention at meal-times. Her final plea was for properly appointed tables with tablecloths, tumblers, and, when the menu requires it, fish knives and forks, so that patients may be encouraged to behave as they would in their own dining-rooms.

ROYAL COLLEGE OF MIDWIVES

ON May 24 Queen Elizabeth the Queen Mother laid the foundation stone of the college's new and enlarged headquarters at 15, Mansfield Street, London, W.1. Since it was founded, as the Midwives Institute in 1881, the work of the college has steadily expanded and every year 2000 students now take its courses. It receives no Government grant, and to complete the new building and endow it an appeal for £150,000 has been made. So far £42,000 has been raised.

CASUALTY CENTRES AT SWINDON

Two casualty centres have been opened at the Swindon works of the Western Region of British Railways. These centres are to be used for dealing with injuries sustained at work by any of the 12,000 employees in the works and offices, and for renewal of dressings and follow-up. Each centre comprises a waiting-room, first-aid treatment room, and rooms for doctor and nurses.

GENERAL MEDICAL COUNCIL

THE results of the recent elections for 11 members to sit for five years were as follows:

ENGLAND AND WALES

Election of 1 member as a person resident in Wales.—The only candidate nominated was Dr. W. V. Howells, who was accordingly elected.

Election of 7 other members.—The result of the voting was as follows:

Dr. JANET AITKEN	16,501
Dr. H. GUY DAIN	15,729
Dr. L. D. CALLANDER	15,277
Dr. O. C. CARTER	14,758
Dr. J. A. BROWN	14,424
Dr. S. N. SCOTT	14,128
Dr. E. A. GREGG	13,936
Dr. Stanley Dillon	8615
Dr. C. T. H. Whiteside	7911

Dr. Aitken, Dr. Brown, Dr. Callander, Dr. Carter, Dr. Dain, Dr. Gregg, and Dr. Noy Scott, were accordingly elected.

SCOTLAND

Election of 2 members.—Two candidates only were nominated, Dr. I. D. Grant and Dr. G. W. Ireland, who were accordingly elected.

IRELAND

Election of 1 member.—The result of the voting was as follows:

Mr. WILLIAM DOOLIN	1376
Dr. M. B. Conlon	485

Mr. Doolin was accordingly elected.

Royal College of Obstetricians and Gynæcologists

At a meeting of the council held on May 26, with Mr. Charles Read, the president, in the chair, the following were elected to the council:

As representatives of the fellows.—Frank Cook, S. W. Maslen-Jones, J. A. Stallworthy, D. M. Hart.

As representatives of the members.—Dorothy M. Shotton, Matthew Garrey.

The following were admitted to the fellowship:

V. H. Barnett, Gavin Boyd, J. E. Giesen, A. D. T. Govan, S. W. J. Harbutt, Stanley Henderson, Derek Jefferiss, N. K. B. Kimbell, Parvati Malkani, K. A. McGarrity, A. H. McLennan, J. D. Murdoch, E. L. Nicolson, L. B. Patrick, I. M. Robertson, Jane B. Roy, G. J. Strean, W. H. Tod.

The following were admitted to the membership:

E. A. Agius, D. G. Bonham, Reginald Bowman, R. J. M. Byrne, J. K. Craig, C. A. Cussen, R. P. De Bond, R. R. Elvidge, J. W. G. Evans, L. A. J. Evans, Jack Eyton-Jones, Winifred J. A. Francis, C. O. Fung-Kee-Fung, J. G. Furber, R. H. Gelb, Anne L. M. Graham, R. G. Harbison, G. F. W. Hossack, G. F. Jolly, Anna R. Kemp, Edward Lacy, J. D. Llewellyn-Jones, E. V. Mackay, John Mander, M. D. Manion, Brian Measday, Nirupama P. Nayak, R. W. A. Nel, J. P. O'Neill, G. M. Parkin, H. E. Reiss, L. L. Relf, Freda M. Roberts, S. B. Robertson, A. W. Russell, Jean M. Sharpe, P. F. Venter, L. M. Wolf.

Society of Apothecaries of London

At recent examinations the following were successful:

M.M.S.A.—A. S. H. DeSilva, E. S. Linton, B. G. Pickles, A. H. Saddler, I. H. F. Swain, M. H. Turner.

L.M.S.S.A.—A. M. Marcus, M. A. C. Lyon, P. L. Pratt, R. S. Kjestrup, S. R. Harris, H. Bezzi, G. Wood, P. J. Sandison, J. B. Middleton, R. A. Harlow, H. Pambakian, J. B. B. Milne, D. H. Brennan, C. L. Wagstaff, B. L. Dodson, W. L. P. Gould, P. G. C. Beney, A. J. D'Souza, D. A. Gilchrist, D. J. Dale, D. G. Thomerson, B. J. P. Wright, G. V. Lewis, E. P. Jackson, A. B. Gilmour.

Royal College of Physicians of London

On Thursday, July 5, at 5 P.M., at the college, Pall Mall East, S.W.1, Dr. Ivan de Burgh Daly, F.R.S., will deliver the Bertram Louis Abrahams lecture when his subject will be intrinsic mechanisms of the lung.

An R.A.M.C. War Memorial

On June 17, at 3 P.M., at R.A.M.C. T.A. Centre, Upper Chorlton Road, Manchester, 16, Major-General Thomas Young, colonel commandant of the corps, will unveil the R.A.M.C. Territorial Army memorial to those who fell in the late war. Relatives and past and present members of the R.A.M.C. units and attached corps may obtain tickets from the centre.

University of London

The following have passed the final examination for the degrees of M.B., B.S.:

Honours.—E. W. J. Brown (*b*), St. Thomas's; J. W. Carter (*a*), King's College Hosp.; B. G. Child (*d*), Charing Cross; D. H. Elliott (*e*), Bart's; Florence P. Forsythe (*b*), Guy's; C. J. W. Hunter (*e*), Bart's; R. F. Jewkes (*d*), Charing Cross; Ann E. Johnson (*c*), Univ. Coll. Hosp.; W. G. G. L. Jones (*e*), King's College Hosp.; S. E. Josse (*e*), Middlesex; Mary C. Munday (*a, d, university medal*), Middlesex; R. W. Portal (*b*), Middlesex; K. T. Tighe (*d*), Guy's.

(*a*) Distinguished in pathology; (*b*) distinguished in medicine; (*c*) distinguished in applied pharmacology and therapeutics; (*d*) distinguished in surgery; (*e*) distinguished in obstetrics and gynæcology.

Pass.—J. A. Abraham, C. D. Addo, Peter Adlington, Barbara A. Alcock, M. J. Andrews, Christos Angeli, C. R. N. Ashbee, Rosemary R. Ashby, Lyn Ashworth, Solomon Vacchus, A. J. M. Bailey, G. R. Ball, Armaity Bamboat, R. O. Barnard, R. M. Barnes, Elaine V. Barraclough, R. D. E. Basden, J. D. G. Baxandall, M. A. Beale, J. S. Beales, M. E. J. Beard, A. W. L. Beatson, M. A. Bedford, P. J. Bekenn, J. D. L. Bell, Phyllis J. A. Bell, R. L. Belsey, Robin Bendall, R. J. J. Bennett, R. V. Berry, John Bertram, L. J. Binnie B. P. Bliss, T. W. Bolton, J. R. Bowles, L. B. H. Boxall, K. W. Braybon, R. S. Britton, C. P. Broad, Susan M. Brocklesby, J. F. Brooks, W. B. J. Broom, Helen R. L. Brown, K. W. Browne, V. R. Bruce, D. M. Bruton, A. G. Bryer, D. W. Bullman, D. R. Burcombe, Maureen V. Burrage, A. L. Bussey, K. A. Butler, M. B. Butler, R. M. C. Butler, R. P. Callaghan, D. I. Campbell, F. P. A. Capps, R. J. Carmichael, G. B. Carter, Malcolm Chapman, Davina C. Cherry, C. D. Chilvers, T. G. C. Christopher, M. D. Churcher, J. M. Clark, A. J. Clement, Elmer Clissold, Dulcie V. Coleman, Delia F. Coney, D. B. Connell, Joseph Connolly, Neville Conway, P. L. Cook, Bryan Corrin, M. H. Cox, Frank Cramer, P. J. Creaven, A. H. Crisp, Nickel Crombie, J. G. Cruickshank, B. J. Cuddigan, J. B. St. Clair Cumberbatch, J. M. Cundy, J. R. Curtis, D. F. Davies, R. D. Davis, B. P. Day, J. J. de Jode, P. L. G. G. Delva, Gillian R. Diamond, J. A. Easton, Helen E. Economides, J. M. Edwards, M. A. Edwards, Alan Elsworth, F. E. Ely, D. M. Entwistle, I. M. Evans, Joy Evans, Rachel G. Evans, J. O. O. Fajemisin, Parviz Faridian Aragh, J. W. J. Fearne, G. M. D. Fleming, P. G. T. Ford, P. A. French, M. J. N. Frohn, P. L. G. Gallwey, G. B. Gillett, A. B. Gilmour, Margaret A. Gordon-Watson, R. A. Gould, Fiona M. Graham, C. B. T. Grant, R. H. E. Grant, Ann B. Gray, J. M. Gray, I. D. Green, G. H. Griffith, P. D. Griffiths, P. D. J. Griffiths, Ajeet-Bans Lall Gulati, Teresa M. Gurrin, D. M. Harris, J. M. Harry, T. D. Haskins, G. W. Hatcher, P. R. Hawley, Benjamin Hecht, R. S. Henderson, Diana K. Henry, R. L. Hewer, Jennifer L. B. Hicks, Thomas Hillier, J. R. Hobbs, A. G. Hocken, Pamela M. Hogg, J. G. Holmes-Milner, C. V. Horn, Jennifer M. Hubble, I. D. Hudson, Pauline M. Hughes, D. I. Hughes-Davies, J. W. Hunt, Ann L. Hunter, J. D. Hurley, H. E. Inniss-Palmer, G. W. Jenkins, Trefor Jenkins, Jane G. Jenkinson, Barbara D. Jones, W. E. O. Jones, A. J. Jordan, A. J. Jouhar, J. M. Kennedy, M. G. Kielty, Barbara C. King, Margaret King, T. J. King, R. F. Knight, Pamela F. Kordik, V. A. Kumoji, G. D. Langham, R. J. K. Law, Marian E. Le Couilliard, P. F. S. Lee, D. S. Leede, J. R. Leeds, B. L. Lees, S. C. Lennox, A. W. F. Lettin, D. J. Lewis, W. G. Lewis, T. M. C. Lindsay, Patricia E. Linnell, D. B. Lloyd, Louis M. Louisy, J. N. Lunn, M. A. C. Lyon, B. C. McDermott, Bertha S. McGill, M. B. R. MacKenzie, D. M. MacLaren, R. E. Maclaurin, Angela de la Condamine Main, P. D. Marsden, P. B. Martin, Edna Matthews, Faith E. Maurice Williams, Ann P. Melville, G. B. Middle, Jerzy Mikolajewski, F. J. C. Millard, Malcolm Millest, W. F. Millner, R. E. Mills, P. H. Minc, B. A. E. Mindham, R. M. Moffitt, Ann H. Montford, D. A. Montgomery, Gwyn Morgan, J. A. Morgan, K. H. Morgan, M. T. Morgan, G. M. Morris, J. R. Morton, P. A. Mounfield, Janice H. Mount, G. G. Muir, Barrie Murphy, J. K. Murphy, Pamela M. Mylward, P. H. Nankivell, A. I. C. Napier, F. J. Nash, M. A. Nelson, A. I. E. Nichini, E. R. Nye, N. W. J. Oliver, C. M. O'Neill, Pamela D. Osborn, D. A. Packham, Hosep Pambakian, D. R. J. Parrott, D. L. Parry, Margaret R. Paton, José Payan, R. S. Peachey, R. L. V. Pearce, W. S. Pease, D. E. Pegg, P. A. Pelham, Eifion Phillips, Hazel M. Phillips, T. T. Phillips, Ann P. Pickering, B. N. Pickering, G. E. Pickup, J. F. G. Pigott, P. W. Pitt, Iris C. Platt, I. H. Porter, C. J. Powel Smith, John Price, Anna Pridal, Glyn Priddle, Valerie J. Prior, John Quantrill, M. C. Rang, Shirley G. Ratcliffe, W. D. Rees, D. E. Rendle, Kathleen M. Rich, D. A. Richardson, F. J. Roberts, A. R. Robertson, R. H. Robinson, W. D. Roche, R. K. Rondel, P. O. Rosanwo, I. G. Ross, Charmian A. Russell, D. G. L. K. Russell, J. A. Russell, Mary G. Russell, R. D. Sandfield, Winifred Sanford, J. V. Sawdy, Bryan Scaife, Elizabeth A. Scharff, P. M. Schiller, M. P. Y. Scott, P. J. Scott, A. K. Seeram, H. T. Shacklock, Malcolm Sharp, A. J. H. Shepherd, M. C. Sheppard, Margaret T. Shiells, Michael Shillito, C. D. G. L. Shimmin, G. R. Silver, P. J. G. Simons, E. C. Smart, D. G. Smith, G. L. Smith, Jean M. B. Smith, Marguerite E. Smith, P. G. Smith, R. B. F. Smith, Elizabeth A. Spence, D. M. Stainton-Ellis, R. E. Steel, A. S. V. Steele, M. D. B. Stephens, D. O. Stewart, P. J. Stiles, Susan Stonestreet, A. J. Sutton, G. R. Swift, A. R. Tanser, C. G. Taylor, D. J. Terry, P. H. J. Theobald, A. A. L. Thomas, D. B. Thomas, G. D. Thomas, G. R. Thompson, G. J. Thorpe, A. C. Ticehurst, J. E. Tindle, Dilcas M. Tingle, J. W. Turner, Jennifer M. Vann, W. H. C. Walker, Margaret M. Walshe, W. J. Walton, Judith C. R. Wardle, Edna M. Watson, R. R. Welsh, Harry Westbury, C. T. Western, David Whitby, A. C. Whitmore, P. C. Wilkinson, P. E. K. Will, D. O. Williams, E. J. Williams, I. A. Williams, D. J. Willsher, D. W. Wilson, F. D. Wilson, P. E. H. Wilson, P. J. E. Wilson, Shirley J. Wilson, Donald Winstock, Anne Winterton, A. J. Wood, C. D. Wooding, T. K. W. Woolacott, J. A. R. Worthy, B. C. Wyatt, P. R. Wykes, Grace O. Yoloye, R. C. Young, Barbara K. Zamoyska.

Biochemical Society

A joint meeting of this society with the Scandinavian biochemical societies will be held in the Department of Biochemistry, Tennis Court Road, Cambridge, from June 28 to 30.

Cambridge Graduates' Medical Club

The annual meeting and dinner of this club will be held at Queens' College on Friday, June 22. Further particulars may be had from Dr. T. B. Anderson, 1, Huntingdon Road, Cambridge.

Prison M.O.s' Conference

The annual conference of prison medical officers and psychologists was held at the Home Office on May 25, with Dr. H. K. Snell, director of the medical services of the Prison Commission, in the chair. The opening address was given by Sir Lionel Fox, chairman of the commission, and other speakers included Dr. W. E. Lloyd and Dr. F. H. Brisby.

Harveian Society of London

At the society's Buckston-Browne Gray-Hill dinner, held on May 25 at the Royal College of Surgeons, the president, Dr. Maurice Long, spoke of plans for celebrating next year's tercentenary of the death of Harvey. These included a scientific meeting and a visit to Folkestone; and it was hoped that the occasion would be one of the most memorable scientific events of 1957. Dr. Long was replying to the toast of The Society, cordially proposed by Dr. Charles Hill. Dr. Long recalled that it was now 100 years since the society's members first dined together; but he did not say whether the presence of ladies for the first time at this year's dinner was an innovation to mark the centenary. At all events, Dr. Hill congratulated the society on this change in custom. Dr. D. Geraint James, an honorary secretary, welcomed The Guests, for whom Colonel Conn Milburn, medical attaché to the U.S. Embassy, replied.

CORRIGENDA.—*Paraplegia Following Spinal Anæsthesia.*—In line 11 of the case-report by Dr. J. P. Payne and Dr. S.-E. Bergentz (May 12, p. 666), the concentration of cinchocaine hydrochloride should have read 1/1500 and *not* 1/500.

Iodine and Fluorine.—In our report of May 19 (p. 745), we wrongly stated that 5 mg. per litre was an adequate iodine level for drinking-water. The correct figure is 5 µg. per litre.

Appointments

MCGRATH, P. G., M.B. Glasg., D.PSYCH.: whole-time consultant, Broadmoor Institution, Crowthorne.

RITCHIE, E. A., M.B. Lond., M.R.C.P., D.P.M.: asst. psychiatrist, St. Augustine's Hospital, Canterbury.

Birmingham Regional Hospital Board:

ABSON, E. P., M.B. Manc., F.R.C.S.: whole-time senior casualty officer, Dudley and Stourbridge group.

HOLZER, R. S., M.D. Berne: part-time asst. geriatrician (S.H.M.O.), Birmingham (Dudley Road) group.

SAVAGE, C. R., M.B. Lond., F.R.C.S.: part-time consultant general surgeon, South Warwickshire group.

East Anglian Regional Hospital Board:

CANDY, JOHN, M.B. Lond., F.R.C.S.: senior surgical registrar, Ipswich and East Suffolk Hospital.

PARTINGTON, M. W., M.B., PH.D. Lond.: pædiatric registrar, Jenny Lind Children's Hospital, Norwich.

SMITH, M. N., M.B. Lond: pædiatric registrar, Peterborough area

THOMAS, D. L. C., M.D. Lond., D.P.M.: consultant psychiatrist, Suffolk mental hospitals.

VOYSEY, M. M., M.B. Lond.: anæsthetic registrar, United Norwich Hospitals.

South-Western Regional Hospital Board:

CONWAY, H. J., M.B. N.U.I., D.P.M.: asst. psychiatrist, Roundway Hospital, Devizes.

CRAFT, M. J., M.B. Lond., M.R.C.P.E.: deputy medical superintendent, Royal Western Counties Institution, Starcross.

ENGLAND, E. J., M.B. Adelaide: surgical registrar, Gloucestershire Royal Hospital, Gloucester.

GALLA, THOMAS, M.B. Edin., D.P.M.: asst. psychiatrist, Bristol mental hospitals.

ROBINSON, R. M., M.B. Lond.: surgical registrar, Weston-super-Mare General Hospital.

SLEIGH, B. E., M.B. Manc., F.F.A. R.C.S., D.A.: senior anæsthetic registrar, Frenchay Hospital, Bristol.

WEEKS, K. F., M.B. Lond., D.P.M.: asst. psychiatrist, Moorhaven Hospital, Ivybridge, S. Devon.

Births, Marriages, and Deaths

BIRTHS

MURPHY.—On April 29, to Inez, wife of Eugene F. Murphy, M.D., M.R.C.P.E., Seacroft Hospital, Leeds—twin daughters. Deo Gratias.

DEATHS

REVELL.—On May 26, following an operation at University College Hospital, London, Rowan William Revell, M.D., D.P.H., medical officer of health for Guernsey, dearly beloved husband of Mary Revell.

Timothy grass . . . . . insignificant in Yucatan★

★ *in Yucatan the high humidity discourages high pollen concentrations in the air.*

but when pollens are a problem

PIRITON is the most effective therapeutic agent for the control of hay fever symptoms. Owing to its low dosage, lack of side-effects and high degree of tolerance, Piriton may be given with safety over the long periods necessary for adequate control of hay fever. Welcome relief of sneezing and lacrimation is obtained in some cases within 10 minutes and in most cases within 30 minutes; following a single dose, given orally, a relatively symptom-free state may be maintained for up to 6 hours.

Piriton

Trade Mark

TABLETS Piriton Maleate are available in bottles containing 25 and 500 tablets. Each tablet contains 4 mg. of Piriton (chlorpheniramine maleate).

INJECTION of Piriton Maleate is available in boxes of 5 and 100 ampoules of 1 c.c. Each c.c. contains 10 mg. of Piriton (chlorpheniramine maleate).

PAEDIATRIC SYRUP is supplied in bottles of 4 fluid ounces and 2 litres. Each teaspoonful contains 2 mg. of Piriton (chlorpheniramine maleate).

C56/103-4

ALLEN & HANBURYS LTD · LONDON · E·2

TELEPHONE: BISHOPSGATE 3201 (20 LINES). TELEGRAMS: "GREENBURYS, BETH, LONDON"

du MAURIER
the filter tip
cigarette

CORK TIP IN THE RED BOX
PLAIN TIP (MEDIUM) IN THE BLUE BOX

When they're convalescing

A little

MOUSSEC

does them a lot of good

Moussec is a perfect natural sparkling stimulant for cases of mental depression, debility and general apathy. Produced only from specially selected grapes by the entirely natural process of double fermentation and free from fortification by any form of spirit it is purity and goodness itself.

THE BABY BOTTLE (ONE-GLASS SIZE) is both adequate and economical. It ensures that the patient gets the benefit of Moussec always in its freshest, most sparkling form.

Baby Moussec is obtainable from all Wine Merchants and Licensed Grocers at 2/3. There are also larger sizes at 4/4, 8/9 and 16/6.

MOUSSEC LTD RICKMANSWORTH HERTS.

Cataplasm for an Ulcer

The Black Chamaeleon, when prepared with the juice of the fig, was recommended by Hippocrates for the treatment of ulcers and suppurating wounds. A far more satisfactory measure which can be swiftly and cleanly applied today is local ultra-violet irradiation. The application of ultra-violet rays, using the appropriate technique, not only combats the infection through the direct bactericidal effect of the rays. Also, by increasing the autobactericidal power of the blood, it positively stimulates the processes of healing by increasing local circulation and promoting healthy granulation through the production of tissue-repair hormones.

For this application the Kromayer Lamp, produced by Hanovia, has proved an excellent apparatus. You are invited to write for further details.

Hanovia SLOUGH · BUCKS

Lamps Division of Engelhard Industries Ltd.

SPECIALISTS IN ULTRA-VIOLET RAY EQUIPMENT FOR ALL APPLICATIONS

TGA M226

...the virtues of LUCOZADE

It is realised that the doctor judges Lucozade from two viewpoints. He agrees with its use in the sickroom. He also, personally, finds it a most palatable drink. This palatability of Lucozade provides a long-sought answer to a long-standing problem . . . acceptability. The subtle balance between flavour, sparkle and liquid glucose content provides nourishment in a form acceptable even to the feeblest digestion; nourishment retained and assimilated. Doctors have been kind enough to tell us of many conditions which have responded favourably, quickly, to Lucozade. Bedside lockers bear testimony to the confidence it inspires. And many doctors have discovered for themselves the virtues of a glass of Lucozade when they return after a hard round of work.

LUCOZADE
the sparkling glucose drink

REPLACES LOST ENERGY

SANCTIONED ON N.H.S. PRESCRIPTIONS (FORM E.C.10)

EPHAZONE tablets

The rational, symptomatic remedy for bronchial spasm in

ASTHMA & BRONCHITIS

THIS PREPARATION IS NOT ADVERTISED TO THE GENERAL PUBLIC

CONTAINING IN EACH TABLET:

Ephedrine ¼ grain
Theobromine ½ grain
Phenazone 1 grain
Calcium gluconate ¼ grain

EPHAZONE LTD 59 BROOK STREET · LONDON · W1
Telephone: MAYfair 5496

Requests for this Diet Card Filing Box, or other inquiries should be addressed to:
THE SECRETARY, ENERGEN DIETARY SERVICE, 25A, BRYANSTON SQUARE, LONDON, W.1. TELEPHONE: AMBASSADOR 9332.

The right diet at your fingertips

This filing box, designed for the consulting room desk, contains an indexed supply of diet cards for 16 different conditions. The cards are planned to include specimen daily menus which facilitate the patient's co-operation and save the doctor's time. This is one of the services offered free of charge to the medical profession by the Energen Dietary Service.

In special cases, clinical considerations often necessitate the preparation of a diet which takes into account the individual requirements of the patient. On receipt of appropriate information from the practitioner, such diets can be specially constructed and sent through the post; or a consultation can be arranged with a senior dietitian.

The Energen Dietary Service is staffed by fully qualified dietitians, under close medical supervision. It offers independent information and assistance to the medical profession in all dietary and nutritional matters.

ENERGEN DIETARY SERVICE

AVAILABLE ONLY IN THE UNITED KINGDOM.

ASTHMA

Instant relief!

Ever increasing numbers of medical men are relying on Rybarvin Inhalant to combat bronchospasm. The Ministry of Health having agreed to the prices of Rybar asthma inhalants, Rybarvin can be freely prescribed.

RYBARVIN brings relief. Consistently, often spectacularly, attacks are cut short and their frequency lessened. Free from excess acid, non-irritant and non-habit-forming it is an ideal inhalant for all asthmatics young and old.

Formula

Pituitary Extract. Posterior and Anterior Lobe	0·40% w/v
Methylatropine Nitrate	0·14% w/v
Papaverine	0·08% w/v
Adrenaline	0·40% w/v
Ethyl Para-aminobenzoate	0·20% w/v
Iso-butyl Para-aminobenzoate	0·01% w/v

RYBAR INHALER has been specially designed for aerosol therapy. Both Rybarvin and the Inhaler may be prescribed on N.H.S. Form E.C.10.

Samples and details of trial outfits forwarded on request.

RYBAR
LABORATORIES LTD.
TANKERTON · KENT

NEW popular size

UNBREAKABLE

Atlas
2ml NYLON SYRINGE
WITH SOLID PLUNGER
(Record Fitting)

★ *Eliminates Glass Breakages*
★ *Interchangeable barrels and pistons save time*
★ *Can be sterilized by boiling or autoclaving at 18lb. steam pressure (120°C.)*
★ *All-in-one barrel and nozzle: no leaks — quick, easy cleaning*
★ *Leak-proof, smooth-working pistons*
★ *Does not affect the pH of solutions*

Range now includes 2 ml, 3 ml, 5 ml, 10 and 20 ml sizes.

Chas. F. Thackray LTD.

Head Office:
THE OLD MEDICAL SCHOOL
PARK STREET, LEEDS 1
Tel.: 20085 (5 lines)

Also at 38 WELBECK STREET, LONDON, W.1. Tel.: WELbeck 8152/3

DROXALIN

A convenient form in which to administer Aluminium Hydroxide treatment

● **DROXALIN** enables Aluminium Hydroxide to be administered in an exceptionally palatable form.

● **DROXALIN** tablets are smooth, pleasant-tasting and break down easily in the mouth. They are, therefore, completely acceptable to the gastric patient. The tablets are individually and hygienically sealed in sets of six.

Professional samples available on request

ACTIVE INGREDIENTS
● *Aluminium Hydroxide*
● *Magnesium Trisilicate*

DROXALIN
Tablets
ACID ADSORBENT
Prescribed on Form E.C.10.

Manufactured by SCOTT & TURNER LIMITED
ANDREWS HOUSE, NEWCASTLE-ON-TYNE

PREVENTION and TREATMENT
in the
SEASIDE SPAS of GERMANY

Cold and warm sea-baths, salt-water drinks, inhalations, and mud baths, as prescribed by experienced Spa physicians, in modern surroundings play a useful part in modern therapy.

Information about the German spas and balneological literature may be had free from: German Tourist Information Bureau, 6, Vigo Street, Regent Street, London, W.1, or Deutscher Bäderverband, Bonn, Lotharstr. 19.

QUEEN

Non Allergic

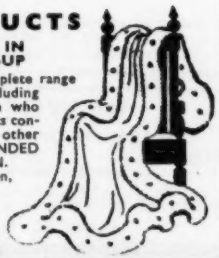
BEAUTY PRODUCTS

THE SAFETY FACTOR IN EVERY DAY MAKE-UP

Queen beauty products form a complete range of toilet and beauty preparations, including lipsticks, specially for those women who have sensitive skins. Queen products contain no orris in any form, nor any other skin irritants AND ARE RECOMMENDED BY THE MEDICAL PROFESSION. Obtainable from John Bell & Croyden, 50 Wigmore Street, W.1, and other chemists.

Write for Price List to:—

BOUTALLS CHEMISTS LTD.
60 Lambs Conduit St., London, W.C.1



SPRINGFIELD HOUSE

Phone: BEDFORD 3417 Near BEDFORD

For MENTAL CASES (including the aged)

Fees from Nine Guineas per week

For forms of admission, &c., apply to the Resident Physician, CEDRIC W. BOWER.

INTERVIEWS IN LONDON BY APPOINTMENT.

CHISWICK HOUSE

PINNER, MIDDLESEX

Telephone: PINNER 234

Private Nursing Home for Mental and Nervous illness. All modern forms of treatment. Two country houses in adjoining grounds of 5 and 6 acres respectively, 12 miles from London. Trains every 15 minutes from Baker Street to Pinner.

DOUGLAS MACAULAY, M.D., D.P.M.

ST. ANDREW'S HOSPITAL FOR NERVOUS AND MENTAL DISORDERS

NORTHAMPTON

PRESIDENT: THE EARL SPENCER

MEDICAL SUPERINTENDENT: THOMAS TENNENT, M.D., F.R.C.P., D.P.H., D.P.M.

This Registered Hospital is situated in 130 acres of park and pleasure grounds. Voluntary patients, who are suffering from incipient mental disorders or who wish to prevent recurrent attacks of mental trouble; temporary patients, and certified patients of both sexes are received for treatment. Careful clinical, biochemical, bacteriological, and pathological examinations. Private rooms with special nurses, male or female, in the Hospital or in one of the numerous villas in the grounds of the various branches can be provided.

WANTAGE HOUSE

This is a Reception Hospital in detached grounds with a separate entrance, to which patients can be admitted. It is equipped with all the apparatus for the complete investigation and treatment of Mental and Nervous Disorders by the most modern methods; insulin treatment is available for suitable cases. It contains special departments for hydrotherapy by various methods, including Turkish and Russian baths, the prolonged immersion bath, Vichy Douche, Scotch Douche, Electrical baths, Plombières treatment, etc. There is an Operating Theatre, a Dental Surgery, an X-ray Room, an Ultraviolet Apparatus, and a Department for Diathermy and High-frequency treatment. It also contains Laboratories for biochemical, bacteriological, and pathological research. Psychotherapeutic treatment is employed when indicated.

MOULTON PARK

Two miles from the Main Hospital there are several branch establishments and villas situated in a park and farm of 650 acres. Milk, meat, fruit, and vegetables are supplied to the Hospital from the farm, gardens, and orchards of Moulton Park. Occupational therapy is a feature of this branch, and patients are given every facility for occupying themselves in farming, gardening, and fruit growing.

BRYN-Y-NEUADD HALL

The seaside house of St. Andrew's Hospital is beautifully situated in a park of 330 acres, at Llanfairfechan, amidst the finest scenery in North Wales. On the North-West side of the Estate a mile of sea coast forms the boundary. Patients may visit this branch for a short seaside change or for longer periods. The Hospital has its own private bathing house on the seashore. There is trout-fishing in the park.

At all the branches of the Hospital there are cricket grounds, football and hockey grounds, lawn tennis courts (grass and hard courts), croquet grounds, golf courses, and bowling greens. Ladies and gentlemen have their own gardens, and facilities are provided for handicrafts, such as carpentry, etc.

For terms and further particulars apply to the Medical Superintendent (TELEPHONE: Northampton 4354 (3 lines)), who can be seen in London by appointment.

RUTHIN CASTLE, NORTH WALES

A Private Clinic, the first in Great Britain, for investigation and treatment of all forms of disease, except infectious and mental

Nursing, dietetic, massage, x-ray and laboratory departments — Central heating and a lift to all floors

Inclusive charges — Apply SECRETARY — Telephone: Ruthin 66

CLIFFDEN, TEIGNMOUTH

For the early treatment of nervous disorders and patients needing rest and care

A well-appointed House with spacious balconies and extensive views of the South Devon Coast. Beautiful garden and own dairy in 35 acres in the same grounds, **ROWDENS**, a comfortable house with lovely views. Private road to the beach

There is also a charming house, **EBWORTHY, MANATON, DARTMOOR**, situated in 25 acres, 1100 ft. up for bracing moorland air

Resident Physicians—BERTHA M. MULES, M.D., B.S. ANNE S. MULES, M.R.C.S., L.R.C.P. *Telephones*—TEIGNMOUTH 289 and 537

BOWDEN HOUSE

HARROW-ON-THE-HILL, MIDDLESEX

Established in 1911 Tel. : BYRon 1011 & 4772

(Incorporated Association not carried on for profit)

A private clinic for the treatment of the neuroses and nervous disorders by psychotherapy and all modern physical therapies.

Apply : MEDICAL DIRECTOR

HEIGHAM HALL, NORWICH

PRIVATE MENTAL HOME for Nervous and Mental illness. All types of treatment carried out. Accommodation for Alcoholics and Addicts available. Special Geriatric Unit now open. Fees from 6 gns. per week upwards according to requirements.

Apply to Dr. J. A. SMALL Telephone : Norwich 20080

THE MEDICAL PROTECTION SOCIETY LIMITED

Over 60 years experience in medical defence and protection

Complete indemnity granted to members in cases undertaken on their behalf

ANNUAL SUBSCRIPTION : £1 for first three years for newly qualified entrants and £2 thereafter

Full particulars from the Secretary (Dr. Alistair French), **Victory House, Leicester Sq., W.C.2.** Gerrard 4553 and 4814

Vacancies

ACADEMIC AND EDUCATIONAL SECTION *Page* 38

ANÆSTHETICS

Connaught, E.17. Sr. H.O. 41
Eastman Dental Hosp. & Inst. of Dental Surgery, W.C.1. Reg. .. 41
Highlands Gen., N.21. H.O... .. 41
King Edward Mem., W. Sr. H.O. .. 42
Metropolitan, E.8. Sr. H.O. 42
Whittington, N.19. Sr. Reg. 43
Brighton. Royal Sussex County & Gen. Hosps. Sr. H.O.'s 45
Chelmsford Hosps. Sr. H.O... .. 46
Chesterfield Royal. Reg. 46
Croydon Group H.M.C. Regs. 45/46
Dudley, Stourbridge & Dist. Sr. H.O. 46
Hastings Group H.M.C. Sr. H.O. .. 47
Hitchin Hosps. Sr. H.O. 47
Leeds R.H.B. Locum Regs... .. 48
Manchester R.H.B. P.-t. Cons. .. 39
Manchester R.H.B. Reg. 48
Manchester. South Manchester H.M.C. Sr. H.O. 48
Manchester United Hosps. Reg. .. 48
Mid-Kent H.M.C. Sr. H.O. 48
Newcastle R.H.B. Locum Cons. or Sr. H.M.O. 39
Plymouth. South Devon & East Cornwall. Sr. H.O.'s 49
Poole Gen. Reg. 49
Reading. Royal Berks. Sr. H.O. .. 50
Scotland. Western R.H.B. Reg. .. 50
Sunderland Area H.M.C. Sr. H.O. .. 51
Warrington Infy. Sr. H.O. 52
Dublin. Dr. Steevens' Hosp. P.-t. Cons... 40

BACTERIOLOGY

Scotland. South-Eastern R.H.B. Reg. 50

CARDIOLOGY

Social Medicine Research Unit, E.1. Phys... 38
Newcastle Gen. H.O... 49

CASUALTY

Connaught, E.17. Sr. H.O. 41
Hampstead Gen., N.W.3. Sr. H.O. & Pre-reg. H.O. 41
Metropolitan, E.8. Sr. H.O. 42
West London, W.6. Sr. H.O. .. 43
Birmingham. Dudley Road. Sr. H.O. 44
Birmingham. Selly Oak. Sr. H.O. .. 44
Blackburn Royal Infy. Jr. H.M.O. or Sr. H.O. 45
Brighton. Royal Sussex County. Locum Jr. H.M.O. 45
Cheltenham Gen. & Eye. Jr. H.M.O. 46
Croydon Gen. Reg. 45
Dudley, Stourbridge & Dist. Sr. H.O. 46
East Anglian R.H.B. Reg. 46
Hertford County. Sr. H.O. 47
Maidenhead. H.O. 48
Newcastle Gen. H.O... 49
Perth. County & City Gen. Hosps. H.O. 49
Rhyl. Royal Alexandra. Sr. H.O. .. 50
Salisbury Gen. Sr. H.O. 50
St. Helens & Dist. H.M.C. Sr. H.O... 51
Swansea. Jr. H.M.O... 51
Taunton & Somerset. Pre-reg. H.O. 51
Warrington Infy. Jr. H.M.O. or H.O. or Sr. H.O. 52

CHEST AND TUBERCULOSIS

Brompton Hosp. San., Frimley. Sr. H.O. 41
Brompton, S.W.3. H.O.'s 41
London Chest, E.2. H.O.'s 42
Angus, & Stracathro & Brechin Hosps. B.O.M. Jr. H.M.O... 43
East Lothian Hosps. Group B.O.M. H.O. 46
Grimsby. Springfield. Reg. 46
Sheffield R.H.B. Sr. H.M.O... .. 39
Wigan & Leigh H.M.C. Locum Sr. H.M.O. 40
Ibadan, Nigeria. University College Hosp. Reg. or Sr. H.O. 53

DERMATOLOGY

London, E.1. Sr. Reg... 42
Liverpool. Newsham Gen. Sr. H.O. 47
Manchester & Salford Hosp. for Skin Diseases. Sr. H.O... 48
Scotland. Eastern R.H.B. Reg. .. 50

EAR, NOSE, AND THROAT

South East Met. R.H.B. P.-t. Cons. 39
Birmingham & Midland Ear & Throat. Sr. H.O. or H.O. 44
Carlisle. Cumberland Infy. Sr. H.O. 46
Guildford. Royal Surrey County. Sr. H.O. 46
Ipswich & East Suffolk. H.O. .. 47
Maidstone. Kent County Ophthalmic & Aural. Sr. H.O. 48
Perth. County & City Gen. Hosps. Sr. H.O. 49
Salisbury Gen. Sr. H.O. 50
Welsh R.H.B. Cons. 40

GERIATRICS

St. Matthew's, N.1. Sr. H.O... .. 43
Brighton Gen. H.O. 45
Cardiff. St. David's. Sr. H.O. .. 45
Manchester R.H.B. Cons. 39
Newcastle Gen. H.O... 49
Sheffield R.H.B. P.-t. Sr. H.M.O. .. 39

HÆMATOLOGY

Australian Red Cross Society, Adelaide. Director. 41
Ibadan, Nigeria. University College Hosp. Sr. Reg. 53

INFECTIOUS DISEASES

Bristol Ham Green. Jr. H.M.O. .. 45
North East Met. R.H.B. Reg. .. 49
Nottingham. Heathfield. Locum Jr. H.M.O. 49

LARYNGOLOGY AND OTOLOGY

North West Met. R.H.B. P.-t. Cons. 38

MEDICINE

Camberwell Hosps. M.C. Pre-reg. H.O.'s 41
German, E.8. H.O. 41
Hackney, E.9. Pre-reg. H.O. .. 41
Metropolitan, E.8. Pre-reg. H.O.'s .. 42
Mildmay Mission, E.2. Pre-reg. H.O. 42
North West Met. R.H.B. Cons. .. 38
Prince of Wales's Gen., N.15. Sr. H.O. 42
Royal Free Hosp. Group. Locum Reg. 42
Royal Free Hosp. Group. Jr. H.M.O. 42
South Western, S.W.9. H.O.. 43
St. Charles', W.10. Pre-reg. H.O.'s.. 42
St. Mary Abbots, W.8. H.O.'s .. 43
St. Mary's, W.2. P.-t. Med. O.-P. Asst. (G.P.) 43
St. Stephen's, S.W.10. H.O. 42
University College Hosp., W.C.1. Reg. 43
Wanstead, E.11. H.O. 43
Westminster, S.W.1. Regs. 43
Wimbledon, S.W.20. Sr. H.O. .. 43
Aylesbury. Stoke Mandeville. H.O. 44
Barnstaple. North Devon Infy. Pre-reg. H.O. 44
Barrow-in-Furness. North Lonsdale. Sr. H.O. 44
Bebington. Clatterbridge. Pre-reg. H.O.'s 44
Birmingham R.H.B. Reg. 44
Birmingham. Selly Oak. H.O.'s .. 44
Birmingham. St. Chad's. H.O. .. 44
Bishop Auckland. Gen. H.O. .. 45
Bristol. Manor Park. Jr. H.M.O... 45
Cambridge. Addenbrooke's. Reg. .. 45
Chelmsford. St. John's. H.O. .. 46
Cheltenham Gen. Pre-reg. H.O. .. 46
Chertsey. St. Peter's. Sr. Reg. .. 45
Derby. Derbyshire Royal Infy. Pre-reg. H.O. 46
East Anglian R.H.B. Reg. 46
Grimsby H.M.C. H.O.'s or Sr. H.O.'s 46
Huddersfield Royal Infy. H.O. .. 47
Lancaster. Royal Lancaster Infy. Sr. H.O. 47
Leeds R.H.B. Locum Regs... .. 48
Liverpool R.H.B. P.-t. Cons. .. 39
Newcastle Gen. H.O.'s 49
Newton Abbot. Locum Sr. H.O. .. 49
North East Met. R.H.B. P.-t. Cons. 38
Nottingham City. Reg. 48
Nottingham Gen. Pre-reg. H.O.'s .. 49
Nottingham. Highbury. Sr. H.O. .. 48
Perth. County & City Gen. Hosps. Sr. H.O. & H.O.'s 49
Portsmouth Group H.M.C. Pre-reg. H.O. 50
Rochdale & Dist. H.M.C. H.O.'s .. 50
Scotland. North-Eastern R.H.B. Sr. Reg. 50
Sheffield City Gen. Reg. 50
Stockport Infy. H.O. or Sr. H.O. .. 51
Swansea. Mount Pleasant. Jr. H.M.O. 51
Welsh Regional Bureau. Pre-reg. H.O.'s 52
Westcliff, Essex. Sr. H.O. 52
Wolverhampton Group. Pre-reg. H.O.'s 52
Australia. Royal South Sydney. Med. Supt. 40
Channel Islands. Jersey. Gen. M.O. 53
New Zealand. Taumarunui Hosp. Board. Phys. 41
South Africa. Donald Fraser Hosp., Sibasa. Asst. M.O. 53

NEUROLOGY

Hosp. for Sick Child., W.C.1. Sr. H.O. 43
National Hosps. for Nervous Diseases. Sr. Reg. 42

NEUROSURGERY
National Hosps. for Nervous Diseases. Sr. H.O. or Reg. 42

OBSTETRICS AND GYNÆCOLOGY
Mothers' (Salvation Army), E.5. H.O.'s & Pre-reg. H.O. 42
South East Met. R.H.B. Reg. 43
St. Andrew's, E.3. H.O. 42
St. Mary Abbots, W.8. H.O. 43
Wandsworth Hosp. Group. Reg. & Locum Reg. 43
Ashton, Hyde & Glossop H.M.C. H.O. 44
Barrow & Furness H.M.C. Locum Cons. or Sr. H.M.O. 39
Birmingham. Selly Oak. H.O.'s .. 44
Birmingham. Sorrento Maternity. H.O. 44
Birmingham United Hosps. H.O. .. 44
Blackburn. Queen's Park. H.O. .. 45
Bournemouth. Royal Victoria. H.O. 45
Cambridge. Addenbrooke's. H.O. .. 45
Canterbury. Kent & Canterbury. H.O. 45
Kendal. Westmoriland County. Sr. H.O. 47
Leicester Royal Infy. Locum Sr. H.O. 47
Morecambe. Queen Victoria. Sr. H.O. 48
Newcastle R.H.B. Reg. & Locum Reg. 49
Newcastle upon Tyne H.M.C. & Hexham & Dist. H.M.C. Pre-reg. H.O.'s 49
Nottingham City. Sr. H.O. or H.O. .. 48
Nottingham. Highbury. Sr. H.O. .. 48
Perth. County & City Gen. Hosps. H.O. 49
Pontypridd. East Glamorgan. Sr. H.O. 49
Poole Gen. Sr. H.O.'s 50
Portsmouth Group H.M.C. Sr. H.O. 50
Romford. Rush Green. H.O. 50
Shrewsbury. Royal Salop Infy. & Cross Houses. Pre-reg. H.O. .. 51
Slough. Upton. Locum Sr. H.O. .. 51
Southend-on-Sea. Gen. H.O. 50
Stirling & Clackmannan Hosps. B.O.M. Pre-reg. H.O. 51
Welsh Regional Bureau. Pre-reg. H.O.'s 52
Welsh R.H.B. Locum Sr. H.M.O. .. 40
West Dorset Group of Hosps. Reg... 52
Wolverhampton Group. Pre-reg. H.O. 52

OPHTHALMOLOGY
Birmingham & Midland Eye. P.-t. Clin. Asst. 44
Doncaster Royal Infy. Sr. H.O. .. 46
Guildford. Royal Surrey County. Sr. H.O. 46
Leeds R.H.B. Sr. H.M.O. 39
Liverpool United Hosps. Sr. H.O. .. 48
Scotland. Western R.H.B. Sr. Reg. 50
Welsh R.H.B. Sr. H.M.O. 39

ORTHOPÆDICS
Albert Dock Orthopædic & Fracture, E.16. Sr. H.O. 41
Camberwell Hosps. M.C. Pre-reg. H.O. 41
North East Met. R.H.B. P.-t. Cons. 38
South East Met. R.H.B. Regs. .. 43
Beverley. Westwood. H.O... 45
Ipswich & East Suffolk. H.O. .. 47
Leeds R.H.B. Locum Regs... 48
Perth. County & City Gen. Hosps. Sr H.O. & H.O.'s 49
Portsmouth Group H.M.C. Pre-reg. H.O. 50
Shrewsbury. Royal Salop Infy. Sr. H.O. 51
Stoke-on-Trent. North Staffs Royal Infy. H.O. 51
Welsh Regional Bureau. Pre-reg. H.O.'s 52

PÆDIATRICS
Hosp. for Sick Child., W.C.1. Sr. H.O. 43
St. Charles', W.10. H.O. 42
Bebington. Clatterbridge. Pre-reg. H.O. 44
Birmingham. Selly Oak. H.O. .. 44
Birmingham United Hosps. Sr. H.O. 45
Edinburgh. Royal Hosp. for Sick Child. Locum H.O. 46
Manchester. Duchess of York Hosp. for Babies. Sr. H.O. & H.O. .. 48
Manchester R.H.B. & United Hosps. Sr. Reg. 48
Newcastle Gen. H.O.'s 49
Newcastle R.H.B. Reg. 49
Salisbury Gen. H.O. 50
Taunton & Somerset. H.O. 51
Welsh Regional Bureau. Pre-reg. H.O.'s 52
Wolverhampton Group. Pre-reg. H.O. & Locum H.O. 52

PATHOLOGY
Royal Free Hosp. Group. H.O. .. 42
South West Met. R.H.B. Cons. .. 39
Bath. St. Martin's. Sr. H.O... .. 44
Beverley. Westwood. Sr. H.O. .. 45
Birmingham R.H.B. Reg. 44
Birmingham United Hosps. Sr. H.O. 44
Bury & Rossendale H.M.C. Sr. H.O. 44
Manchester R.H.B. Sr. H.M.O. .. 39
Manchester. Withington. Sr. H.O... 48
Manchester. Wythenshawe. Sr. H.O. 48
Scotland. South-Eastern R.H.B. Sr. H.M.O. 39
Scotland. Western R.H.B. Reg. .. 50
Shrewsbury. Royal Salop Infy./Copthorne. Sr. H.O. 51
South Africa. Provincial Admin. of Cape of Good Hope. Med. Pract. (Grade E) 40

PHYSICAL MEDICINE
Carshalton. St. Helier. Reg. .. 46

PLASTIC SURGERY
Welsh R.H.B. Reg. 52

PSYCHIATRY
North West Met. R.H.B. Cons. & Sr. H.M.O. 38
Tavistock Clinic, W.1. Regs. .. 43
University College Hosp., W.C.1. Reg. 43
Basingstoke. Park Prewett. Sr. Reg. & Jr. H.M.O. 44
Birmingham R.H.B. Reg. 44
Blackburn. Brockhall Hosp. for Mental Defectives. Jr. H.M.O. .. 45
Canterbury. St. Augustine's. Locum Sr. Reg. 45
Devizes. Roundway. Jr. H.M.O. .. 46
Fareham, Hants. Knowle. Jr. H.M.O. 46
Glasgow. Hawkhead (Mental). Sr. H.O. 47
Glasgow Northern Hosps. B.O.M. Sr. H.O. 47
Glasgow. Stobhill Gen. H.O. .. 46
Ivybridge, S. Devon. Moorhaven. Jr. H.M.O. 47
Leeds R.H.B. Cons., P.-t. Cons. & Sr. H.M.O. 39
Leeds R.H.B. Locum Regs... .. 48
Leek, Staffs. St. Edward's. Jr. H.M.O. 47
Lincoln Lawn. Jr. H.M.O. or Locum 47
Manchester R.H.B. Reg. & Sr. H.O. 48
Scotland. South-Eastern R.H.B. Cons. 39
Scotland. Western R.H.B. Reg. .. 50
Sedgefield. Winterton H.M.C. Jr. H.M.O. 51
Sheffield R.H.B. Cons. & Sr. H.M.O. 39
Sheffield R.H.B. P.-t. Sr. H.M.O. .. 40
Sheffield R.H.B. Sr. Reg. 51
South East Met. R.H.B. Sr. Reg. & Regs. 50
Wells, Som. Mendip. Jr. H.M.O. .. 51
Wigan & Leigh H.M.C. Reg. 52
Blackrock, Co. Dublin. St. Augustine's Res. Training Centre. Med. Director 40
Northern Ireland Hosps. Auth. Sr. H.M.O. 40

RADIOLOGY
Cardiff United Hosps. Sr. Reg. .. 45
Newcastle R.H.B. Cons. 39
Sheffield R.H.B. Sr. H.M.O... .. 39
South Africa. Provincial Admin. of Cape of Good Hope. Med. Pract. (Grade D) 40

RADIOTHERAPY
Hammersmith Hosp. & P.G. Med. School, W.12. Reg. 42
Manchester R.H.B. Sr. H.M.O. .. 39
Scotland. Western R.H.B. Sr. Reg. 50
Sheffield. National Centre for Radiotherapy. Sr. H.O. or Reg. 51
South Africa. Provincial Admin. of Cape of Good Hope. Med. Pract.'s (Grades E & D) 40

RHEUMATOLOGY
Charterhouse Rheumatism Clinic, W.1. Sr. Reg. 41
Sheffield United Hosps./R.H.B. Reg. 51
Taplow. Canadian Red Cross Mem. H.O. 51

SURGERY
Battersea Gen., S.W.11. H.O. .. 41
Camberwell Hosps. M.C. Pre-reg. H.O.'s 41
Colindale, N.W.9. Sr. H.O. 41
Connaught, E.17. H.O.'s 41
German, E.8. Pre-reg. H.O... .. 41
Gordon, S.W.1. Reg... 41
Highlands Gen., N.21. H.O... .. 41
Hosp. of St. John & St. Elizabeth, N.W.8. Reg. 41
London Jewish, E.1. H.O. 42
Memorial, S.E.18. H.O.'s 42
Metropolitan, E.8. Pre-reg. H.O.'s .. 42
Prince of Wales's Gen., N.15. Sr. H.O. & H.O. 42
Royal Northern, N.7. H.O... .. 42
South Lodge, N.21. Sr. H.O. .. 43
St. Ann's Gen., N.15. H.O. 42
St. Charles', W.10. Pre-reg. H.O.'s .. 42
St. Leonard's, N.1. H.O. 43
St. Mary Abbots, W.8. H.O.'s .. 43
St. Nicholas, S.E.18. H.O.'s 42
Alton Gen. Sr. H.O. 43
Ashington, Northumberland. Pre-reg. H.O. 44
Barnstaple. North Devon Infy. Pre-reg. H.O. 44
Batley Gen. Sr. H.O. 44
Bedford Gen. H.O. 44
Birmingham. Selly Oak. H.O.'s .. 44
Birmingham. St. Chad's. H.O. .. 44
Birmingham United Hosps. Regs... 44
Brighton Gen. H.O. 45
Bristol. Cossham/Frenchay H.M.C. Sr. H.O. 45
Burton-on-Trent. Gen. H.O. 44
Caerphilly Dist. Sr. H.O. & Pre-reg. H.O.'s 45
Castleford, Normanton & Dist. Sr. H.O. 45
Cheltenham Gen. H.O. 46
Derby. Derbyshire Royal Infy. Pre-reg. H.O. or Sr. H.O. 46
Dudley, Stourbridge & Dist. Pre-reg. H.O.'s 46
Epsom Dist. Pre-reg. H.O. 46
Exeter. Royal Devon & Exeter. H.O. 46
Glasgow. Royal Infy. Sr. H.O. .. 47
Glasgow. Victoria Infy. Sr. H.O. .. 46
Hastings, St. Helen's. Pre-reg. H.O. 47
Hertford County. Pre-reg. H.O. .. 47
Hounslow. H.O. 47
Huntingdon County. H.O. 47
Ilford. King George. Pre-reg. H.O.'s 47
Ipswich & East Suffolk. H.O. & Pre-reg. H.O.'s 47
Isleworth. West Middlesex. Sr. Reg. 47
Leeds R.H.B. Locum Regs... 48
Lincoln County. Pre-reg. H.O. .. 47
Maidenhead. Reg. 48
Manchester. Christie Hosp. & Holt Radium Inst. Sr. H.O. 48
Morecambe. Queen Victoria. Sr. H.O. 48
Newcastle Gen. H.O.'s 49
Newmarket Gen. H.O. 49
Newton Abbot. Sr. H.O. 49
Perth. County & City Gen. Hosps. H.O.'s 49
Plymouth. South Devon & East Cornwall. Sr. H.O. & Pre-reg. H.O.'s 49
Pontypridd. East Glamorgan. Sr. H.O. 49
Ramsgate Gen. H.O... 50
Richmond, Surrey. Royal. Pre-reg. H.O. 50
Scotland. Western R.H.B. P.-t. Cons. 39
Scotland. Western R.H.B. Reg. .. 50
Scunthorpe War Mem. Sr. H.O. .. 50
Shrewsbury. Royal Salop Infy./Copthorne. H.O. 51
Southampton Gen. H.O.'s 50
Southend Gen. H.O.'s 50
St. Albans City. H.O... 51
Stoke-on-Trent. City Gen. Pre-reg. H.O. 51
Taunton & Somerset. H.O... 51
Torquay. Torbay. H.O. 51
Welsh Regional Bureau. Pre-reg. H.O.'s 52
Welsh R.H.B. Regs. 51/52
Whitehaven, Cumberland. Pre-reg. H.O. or Sr. H.O. 52
Wolverhampton Group. Pre-reg. H.O.'s & Locum H.O. 52
Worcester Royal Infy. H.O... .. 52
Wrexham. Maelor Gen. Pre-reg. H.O. 52

THORACIC SURGERY
Brompton, S.W.3. Sr. H.O.'s or Regs. 41
London Chest, E.2. Sr. H.O. or Reg. 42
Aberdeen Gen. Hosps. B.O.M. Jr. H.M.O. 43
Leicester Isolation Hosp. & Chest Unit. Sr. H.O. 47
Newcastle R.H.B. Reg. 49
Nottingham City. Sr. H.O. 48

UROLOGY
Hastings, Buchanan. Locum Sr. H.O. 47

VENEREOLOGY
St. Mary's, W.2. Reg... 43

GENERAL
Northern Ireland Hosps. Auth. Sr. Regs. & Regs. 53

PUBLIC APPOINTMENTS 53
GENERAL PRACTICE 54
TOO LATE FOR CLASSIFICATION 54
MISCELLANEOUS 54

The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies, but candidates may normally visit the hospital by appointment.

Academic and Educational

EXAMINING BOARD IN ENGLAND
by the
ROYAL COLLEGE OF PHYSICIANS OF LONDON
and the
ROYAL COLLEGE OF SURGEONS OF ENGLAND

Notice is hereby given that the following Examinations will commence on the dates stated below :—

DIPLOMA IN PHYSICAL MEDICINE
5th July

DIPLOMA IN INDUSTRIAL HEALTH
DIPLOMA IN OPHTHALMOLOGY
11th July

DIPLOMA IN TROPICAL MEDICINE AND HYGIENE
18th July

Applications and fees for either or both Parts of an Examination must reach the Secretary, Examination Hall, Queen-square, London, W.C.1, at least 21 days before Part I of the Examination begins. FRANCIS M. STENT, Secretary.

UNIVERSITY OF CAMBRIDGE

E. G. FEARNSIDES SCHOLARSHIP : NOTICE
Ordinances, pp. 440 and 540

The E. G. Fearnsides Scholarship is for clinical research on the organic diseases of the nervous system. Candidates must be graduates of the University ; preference will be given to candidates who are graduates in Medicine. The value of the Scholarship is about £80.

Applications must be sent to the Registrary so as to reach him not later than 21st June, 1956.

The Scholarship is a qualification, under the usual conditions, for a State Scholarship.

UNIVERSITY OF LONDON

The ROGERS PRIZE, of the value of £100, will be offered by the Senate in 1957 for an Essay or Dissertation on the following subject :—

"The Causation and Treatment of Portal Hypertension."

The Prize is open to all persons whose names appear on the Medical Register of the United Kingdom.

Applications must be submitted to the Secretary to the Scholarships Committee, University of London, Senate House, London, W.C.1 (from whom further particulars can be obtained), not later than 30th April, 1957.

THE UNIVERSITY OF LEEDS

DIPLOMA IN PSYCHOLOGICAL MEDICINE

A COURSE for the Diploma in Psychological Medicine will commence in OCTOBER, 1956, if sufficient entries are received. Instruction will be part-time and will occupy 3 half-days a week during 8 academic terms (2½ years).

Further particulars may be obtained from the Sub-Dean, School of Medicine, Leeds, 2, to whom application for admission to the course should be sent as soon as possible.

UNIVERSITY OF MANCHESTER

A COURSE in preparation for the DIPLOMA IN PSYCHOLOGICAL MEDICINE will commence in OCTOBER, 1956, subject to a sufficient number of candidates being available. The instruction is part-time covering 3 half-days per week for 8 terms.

Further particulars as to admission and fees may be obtained from the Dean of Postgraduate Medical Studies, The University, Manchester, 13, to whom applications for entry to the course should be made not later than Monday, 2nd July.

BRITISH ASSOCIATION OF PHYSICAL MEDICINE

A WEEKEND COURSE IN PHYSICAL MEDICINE will be held on 29TH, 30TH JUNE and 1ST JULY, 1956.

Further details can be obtained from the Honorary Secretary of the Association, 45, Lincoln's Inn-fields, London, W.C.2.

BURDEN NEUROLOGICAL INSTITUTE, Bristol. Required, a medically qualified RESEARCH ASSISTANT at the above Institute interested in research in neuro-psychiatry. Initial appointment for 1 year. Opportunities for research work in neurology, electrophysiology, and psychiatry. Salary according to experience but not less than Senior House Officer rate.

Applications to be made to the Director of the Institute.

MEDICAL RESEARCH COUNCIL have Scientific Staff Vacancy at National Institute for Medical Research, Mill Hill, London, N.W.7, for research on chemotherapy and parasitology, especially as related to tropical infections.

Applicants should have a medical qualification or a good honours degree in zoology or biochemistry with some research experience. The appointment would be for 3 years in the first instance (with review after 1 year). Commencing salary will be determined by qualifications and experience, and will be within the range £750–£1150 with F.S.S.U. and child allowances.

Applications, giving full personal particulars, including details of academic career and reference to any scientific publications, and the names of 2 professional referees, to the Director.

SOCIAL MEDICINE RESEARCH UNIT of Medical Research Council requires PHYSICIAN who has held appointment as Senior Registrar in a department of cardiology or department of general medicine which gave experience in cardiology, to develop field studies of cardiovascular disease including nutritional aspects. The appointed man will also be attached to the Cardiac Department, London Hospital. Salary in accordance with qualifications and experience ; child allowances ; superannuation. Appointment for 1 year in first instance.

Apply to Unit's Director at Research Laboratories, London Hospital, Ashfield-street, Whitechapel, E.1.

UNIVERSITY OF LONDON. The Senate invite applications for the READERSHIP IN OBSTETRICS AND GYNÆCOLOGY tenable at the Institute of Obstetrics and Gynæcology (salary within range £1900–£2400 a year).

Applications (10 copies) must be received not later than 4th July, 1956, by the Academic Registrar, University of London, Senate House, W.C.1, from whom further particulars may be obtained.

THE UNIVERSITY OF LIVERPOOL. Applications are invited for the post of SENIOR LECTURER in the Department of Studies in Psychological Medicine, at an initial salary within the range £1750–£2050 p.a., according to qualifications and experience. Candidates should be in possession of a higher qualification in medicine and a special qualification in psychological medicine. The post carries with it consultant sessions at the Royal Infirmary (United Liverpool Hospitals) and with the Liverpool Regional Hospital Board.

Applications, stating age, academic qualifications and experience, together with the names of 3 referees, should be received not later than 16th June, 1956, by the undersigned, from whom further particulars of the conditions of appointment may be obtained. STANLEY DUMBELL, Registrar.

THE UNIVERSITY OF LIVERPOOL. Faculty of Medicine. Applications are invited from medically-qualified candidates for the post of ASSISTANT LECTURER or LECTURER in the Sub-Department of Anæsthesia. The initial salary for an Assistant Lecturer will be £700 p.a. and for a Lecturer within the range £1000–£1200 p.a., according to qualifications and experience.

Applications, stating age, academic qualifications and experience, together with the names of 3 referees, should be received not later than 16th June, 1956, by the undersigned, from whom further particulars of the conditions of appointment may be obtained. STANLEY DUMBELL, Registrar.

UNIVERSITY OF MALAYA, Singapore. Applications are invited for 2 (*a*) LECTURESHIPS or (*b*) ASSISTANT LECTURESHIPS IN ANATOMY. Duties to be assumed by October, 1956. Experience in teaching histology, embryology, neurology, and gross anatomy essential. Salary scales : for medically qualified persons : (*a*) £1295–£49–£1442/£1540–£56–£1988 p.a. ; (*b*) £1148–£49–£1246 p.a. Otherwise (*a*) £1148–£49–£1442/£1540–£56–£1820 p.a. ; (*b*) £1001–£49–£1099 p.a. Entry point according to qualifications and experience. Allowances : expatriation in range £280–£308 p.a., cost-of-living in range £210–£560 p.a. All paid in Malayan currency. Passages for appointee, wife, and children under 12 years. Part furnished quarters at reasonable rent. Provident Fund Scheme.

Applications (6 copies), naming 3 referees, and detailing qualifications and experience, by 30th June, 1956, to Secretary, Inter-University Council for Higher Education Overseas, 29, Woburn-square, London, W.C.1, from whom further particulars may be obtained.

Hospital Services : Senior Appointments

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

Part-time CONSULTANT PHYSICIAN to Hertford Group of hospitals for 6 sessions a week. Duties mainly at County Hospital, Hertford and Haymeads Hospital, Bishops Stortford. Residence in Group area is a condition of appointment.

Maximum Part-time CONSULTANT ORTHOPÆDIC SURGEON to Leytonstone and Forest Groups of hospitals. Duties mainly at Whipps Cross Hospital, E.11, and Connaught Hospital, E.17. Residence in area is a condition of appointment.

Part-time CONSULTANT ORTHOPÆDIC SURGEON to Brentwood District Hospital, Brentwood, Essex, for 2 sessions a week.

Applications (6 copies), and names of 3 referees, should reach the Secretary, 11A, Portland-place, London, W.1, by Saturday, 16th June.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) PSYCHIATRIST AND SUPERINTENDENT (resident), whole-time, Consultant grade, Friern Hospital, New Southgate, N.11 (2470 Beds). New house being built but in the meantime temporary accommodation available.

Applications before 2nd July, 1956.

(2) CONSULTANT PHYSICIAN (whole-time), to organise and develop a Department of Industrial Medicine based on Central Middlesex Hospital. Extensive knowledge and wide experience of industrial medicine essential. Beds will be made available as needed and suitable social welfare and secretarial assistance provided. The post will involve teaching and facilities for research will be arranged.

Applications before 2nd July, 1956.

(3) CHILD PSYCHIATRIST (Senior Hospital Medical Officer grade) whole-time or 9 half-days a week, Berkshire Child Guidance Service. Service administered by Joint Committee of Berkshire County and Reading Education Authorities and Oxford and North West Metropolitan Regional Hospital Boards. Duties include clinic at Maidenhead, sessions in Reading Clinic and psychiatric care of children in hostels for maladjusted children in Maidenhead and Wokingham. Possibility of session for adult psychiatric outpatients at Royal Berkshire Hospital.

Applications before 13th July, 1956.

Hospitals and Clinics may be visited by direct appointment.

(4) CONSULTANT AURIST, 1 half-day a week, Audiology Unit, Heston School for the Deaf, Vicarage Farm-road, Heston. Unit may be visited by arrangement with the Area Medical Officer, 92, Bath-road, Hounslow.

Applications before 11th July, 1956.

Application forms obtainable from, and returnable to, Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Part-time CONSULTANT in E.N.T. Surgery for 4 notional half-days a week, in the Lewisham Group of hospitals. Candidates must have had wide experience in E.N.T. surgery and be Fellows of a Royal College of Surgeons. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales). Candidates may visit the hospitals concerned.

Apply, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 16th June, 1956.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Whole-time CONSULTANT NEUROPATHOLOGIST at the Fountain Hospital, S.W.17. Experience in the pathology of mental deficiency desirable.

Applications by letter (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to the Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 30th June, 1956. Applicants may visit Hospital by local arrangement.

BARROW AND FURNESS HOSPITAL MANAGEMENT COMMITTEE. Locum Tenens Whole-time or maximum Part-time CONSULTANT in Obstetrics and Gynæcology required for period of 4–6 weeks, commencing as soon as possible, in the Barrow and Furness Group of hospitals. Remuneration £50 or 45 guineas per week for a Consultant or 31½ guineas per week for Medical Practitioners not graded as a Consultant.

Applications to Group Secretary, 105, Abbey-road, Barrow-in-Furness, immediately.

LEEDS REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT OPHTHALMOLOGIST (Senior Hospital Medical Officer scale) for duties at the Royal Eye and Ear Hospital, Bradford, and the Bradford, Dewsbury and West Riding County Council School Clinics. The person appointed to reside in Bradford.

Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer scale) for duties at Storthes Hall Hospital, Kirkburton, near Huddersfield (2680 Beds), and associated clinics at Huddersfield, Halifax, and Dewsbury. Applicants should hold the D.P.M. or other equivalent qualifications. Resident or non-resident, a large modern unfurnished flat is available if required and accommodation is also available for a single person.

Whole-time CONSULTANT PSYCHIATRIST AND DEPUTY PHYSICIAN-SUPERINTENDENT (non-resident) for duties at De la Pole Hospital, Willerby, near Hull (1000 Beds, including Neurosis Unit for female patients). Successful candidate will have extramural duties at general hospitals in the Hull area, and will be required to reside within 5 miles of the Hospital. Candidates should hold high qualifications in medicine and psychiatry and preferably have had experience of administrative aspects of the specialty. Further details of the duties may be had on application.

Part-time CONSULTANT PSYCHIATRIST (9 notional half-days per week) with special experience in child psychiatry. The successful candidate will undertake duties in association with the Child Guidance Services of the Bradford and Huddersfield Education Committees at clinics in the respective areas.

Applications (12 copies), stating age, qualifications and details of appointments held showing dates, with names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, by 23rd June, 1956.

LIVERPOOL REGIONAL HOSPITAL BOARD. Ormskirk GROUP. Applications are invited for the post of Part-time CONSULTANT PHYSICIAN giving 4 notional half-days in the above Group, with duties mainly at Ormskirk County and Ormskirk General Hospitals. Applicants must possess a higher qualification in medicine.

Forms of application from, and to be returned to, Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 23rd June, 1956.

VINCENT COLLINGE, Secretary to the Board.

MANCHESTER REGIONAL HOSPITAL BOARD.

(*a*) Whole-time (or maximum Part-time) CONSULTANT PHYSICIAN (geriatrics) to the Wigan and Leigh Hospital Centre (chronic sick beds totalling 320 mainly at Billinge Hospital, Wigan, and Atherleigh Hospital, Leigh). Good experience in general medicine, special interest and experience in the treatment and rehabilitation of the chronic sick and higher qualifications essential. Appointee required to undertake the domiciliary investigations of patients and establish close liaison with general practitioners and local health authorities. 18th June, 1956.

(*b*) Maximum Part-time CONSULTANT ANÆSTHETIST to the Bolton and District Hospital Centre (Bolton Royal Infirmary, 327 Beds; Bolton District General Hospital, 604 Beds, &c.). Wide experience and higher qualifications essential; appointee to live in area. 20th June, 1956.

(*c*) Whole-time ASSISTANT PATHOLOGIST (Senior Hospital Medical Officer) to the Wigan and Leigh Hospital Centre (main laboratories at the Royal Albert Edward Infirmary, Wigan, and Leigh Infirmary). General experience essential, but special experience in bacteriology desirable. Successful candidate will work under general guidance of a Consultant. 19th June, 1956.

(*d*) Whole-time NON-RESIDENT ASSISTANT RADIOTHERAPIST (Senior Hospital Medical Officer), Christie Hospital and Holt Radium Institute, Manchester. F.F.R. or other higher qualification desirable; appointee to live in or near Manchester. 20th June, 1956.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by dates stated.

NEWCASTLE REGIONAL HOSPITAL BOARD. Durham AND NORTH-WEST DURHAM HOSPITAL MANAGEMENT COMMITTEE AREAS. (Main hospitals: Dryburn Hospital, Durham, 300 Beds; Chester le Street General, 200 Beds; Shotley Bridge General, 550 Beds.) CONSULTANT RADIOLOGIST, whole-time or part-time for a minimum of 9 notional half-days per week. Appointee will be required to work in both Hospital Management Committee Groups (approximately half-time in each) and to reside within the area of either group.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6, within 28 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. West CUMBERLAND GROUP OF HOSPITALS. Locum ANÆSTHETIST (whole-time) required from 29th July to 30th September, 1956. Remuneration at Consultant or Senior Hospital Medical Officer level according to qualifications and experience.

Applications immediately to Senior Administrative Medical Officer, 72, Warwick-road, Carlisle.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a Whole-time ASSISTANT PATHOLOGIST (Senior Hospital Medical Officer grade) to the Edinburgh Northern Group of hospitals, based on the Western General Hospital.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 3 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 30th June.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of DEPUTY PHYSICIAN-SUPERINTENDENT (whole-time Consultant) to the Fife Mental Hospitals.

Applications, giving particulars of age, previous experience and qualifications, together with the names of 3 referees, should be sent to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 23rd June, 1956. Further particulars on application.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments:—

CONSULTANT SURGEON at the Royal Infirmary, Glasgow.

CONSULTANT SURGEON at the Victoria Infirmary, Glasgow.

The appointments will be part-time on the basis of 7 notional half-days per week.

These appointments are subject to the National Health Service (Scotland) superannuation regulations.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, not later than 30 days after the publication of this advertisement.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT CHEST PHYSICIAN for the Chesterfield and North Derbyshire Area. Duties will include attendance at the 2 Chest Clinics and Walton Hospital (146 Beds) where there is an active Thoracic Surgical Unit in which both tuberculosis and non-tuberculosis work is undertaken. Salary scale £1500–£50–£1950.

Application forms and further details from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, forms to be returned by 30th June, 1956.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT RADIOLOGIST for Derbyshire Royal Infirmary to work under the direction of Consultant Radiologist-in-charge. Candidates should possess a Diploma in Radiology. Salary scale £1500–£50–£1950.

Application forms and further details from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 30th June.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time CONSULTANT PSYCHIATRIST required at Pastures Hospital, Mickleover, near Derby. Modern house available.

Application forms and further details from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 30th June.

SHEFFIELD REGIONAL HOSPITAL BOARD. Part-time MEDICAL OFFICER (based on Hillcrest Hospital, Leicester) for 6 notional half-days per week for the Leicester Geriatrics Service. Salary within Senior Hospital Medical Officer scale.

Application forms and further details from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 30th June.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR ASSISTANT PSYCHIATRIST required for Bracebridge Heath Hospital, Lincoln. Salary scale £1500–£50–£1950.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 30th June, 1956.

AMENDED ADVERTISEMENT

WELSH REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT OPHTHALMOLOGIST (Senior Hospital Medical Officer scale), Newport and East Mon Hospital Management Committee area. Based at Royal Gwent Hospital, Newport (260 Beds). Duties include visits to other hospitals within neighbouring Hospital Management Committee groups. Successful candidate will work under Consultants-in-charge. Non-resident.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

SHEFFIELD REGIONAL HOSPITAL BOARD. Senior ASSISTANT PSYCHIATRIST required for 5 notional half-days per week at St. Catherine's Institution, Doncaster (500 M.D. Beds). Salary within Senior Hospital Medical Officer scale.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 23rd June, 1956.

WELSH REGIONAL HOSPITAL BOARD. Whole-time Locum Tenens SENIOR HOSPITAL MEDICAL OFFICER in Obstetrics and Gynaecology required at St. James' Hospital, Tredegar, 10th–23rd June, 1956.

Applications, naming 2 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff.

WELSH REGIONAL HOSPITAL BOARD. Consultant E.N.T. SURGEON for Clwyd and Deeside Hospital Management Committee. Based at St. Asaph Hospital with visits to other hospitals in Group. May also be required to undertake occasional duties in neighbouring groups. Optional whole-time/maximum part-time appointment.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

WIGAN AND LEIGH HOSPITAL MANAGEMENT COMMITTEE. Locum Whole-time SENIOR HOSPITAL MEDICAL OFFICER in Chest Diseases (Male or Female). 31½ guineas weekly. Resident or non-resident. Previous experience in chest work essential.

Applications to Secretary, Knowsley House, Wigan. Closing date 5th June, 1956.

SOUTH AFRICA. PROVINCIAL ADMINISTRATION OF THE CAPE OF GOOD HOPE. HOSPITALS DEPARTMENT. Vacancies.

1. Applications are invited from registered medical practitioners (registered specialists) for appointment to the following posts :—

MEDICAL PRACTITIONER (Grade E), Pathologist, with salary at the rate of £1860 p.a (fixed) at Kimberley Hospital, Kimberley, Cape Province.

MEDICAL PRACTITIONER (Grade D), Radiologist, with salary at the rate of £1740 p.a. (fixed) at the Sir Henry Elliot Hospital, Umtata, Cape Province.

2. In addition to the salary indicated above, a cost-of-living allowance at rates prescribed from time to time by the Administration is payable, at present amounting to £234 p.a. for a married man.

3. The conditions of service are prescribed in terms of Hospital Board Service Ordinance No. 19 of 1941, as amended, and the regulations framed thereunder.

4. The successful candidates will be required to submit satisfactory birth and health certificates and their appointment will be subject to the following conditions :—

(i) Appointment will be on contract for 5 years in the case of a citizen of a Commonwealth country or the Republic of Ireland and 6 years in the case of a citizen of European countries other than the United Kingdom and the Republic of Ireland.

(ii) Transport expenses (third class by rail overseas and second or cabin class steamship fare and first class by rail in the Union) necessarily incurred by the successful applicant and his family, if any, from place of residence to the place of assumption of duty in the Cape Province will be defrayed by the Administration provided that, if the contract is broken within 1 year of the date of assumption of duty the persons appointed must refund to the Administration the full amount paid in respect of transport expenses and if the contract is broken within 5 years of the date of assumption of duty in the case of a Commonwealth citizen and 6 years in the case of a citizen of another European country, the persons appointed shall refund to the Administration the pro rata share of the full amount above referred to in respect of the unexpired period.

(iii) The persons so appointed will be offered permanent appointment during the terms of contract but not earlier than 3 years from the date of assumption of duty or with effect from the conclusion of the contract, provided they have passed an examination in Afrikaans as second language, which examination shall not be lower than the standard required for the Junior Certificate Examination of the Department of Education of the Cape Province and provided further that their services and conduct during the period of contract are satisfactory and their state of health is such as will enable them to continue to discharge efficiently all the duties of the posts in which they will be employed.

6. Application must be made in duplicate on the prescribed form, Staff 23, which is obtainable from the Staff Clerk, Room 309, South Africa House, Trafalgar-square, London, W.C.2.

7. The completed application forms must be addressed to the Director of Hospital Services, P.O. Box 2060, Cape Town, South Africa, and must reach him not later than 23rd June, 1956.

8. Candidates must state the earliest date on which they can assume duty.

BLACKROCK, co. DUBLIN. ST. AUGUSTINE'S RESI-DENTIAL TRAINING CENTRE AND SPECIAL SCHOOL FOR MENTALLY SUBNORMAL PATIENTS. Applications are invited for the whole-time pensionable position of MEDICAL DIRECTOR (Psychiatrist) at the above Centre and for duties at other similar Centres conducted by the Hospitaller Brothers of St. John of God. A high standard of professional qualifications and experience is required.

Application forms with particulars sent on request. Completed forms to be returned not later than 15th June, to the Rev. Brother Secretary, St. Augustine's, Obelisk-park, Blackrock, co. Dublin.

DUBLIN. DR. STEEVENS' HOSPITAL. Applications are invited for the post of CONSULTING ANÆSTHETIST to the above Hospital. The successful applicant will be responsible for the administration of the Anæsthetic Department. Duties will be on a maximum part-time basis including 6 weekly sessions, emergencies and the teaching of house surgeons and students. Remuneration will be in accordance with terms and conditions for teaching hospitals anæsthetists under the Health Act. Travelling expenses if called for interview. Further particulars may be obtained from Hospital Secretary. No canvassing, but Hospital may be visited.

Applications, stating age, nationality, qualifications and details of experience with the names of 2 referees, should be forwarded to the Secretary of the Board of Governors, on or before 2nd July, 1956.

NORTHERN IRELAND HOSPITALS AUTHORITY. Applications are invited for the whole-time post of PSYCHIATRIST, in the grade of Senior Hospital Medical Officer, at Londonderry and Gransha Hospital, Londonderry. The terms, conditions of service and remuneration will be in accordance with the Authority's application of the Spens report to Northern Ireland.

Applications to be made on a form obtainable (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, 44–46, Queen-street, Belfast, and to be returned not later than 23rd June, 1956.

SOUTH AFRICA. PROVINCIAL ADMINISTRATION OF THE CAPE OF GOOD HOPE. UNIVERSITY OF CAPE TOWN. Joint Medical Staff for Groote Schuur and other Teaching Hospitals. Vacancies.

Applications are invited from registered medical practitioners (registered specialists) for appointment to the following vacant posts at the Groote Schuur Hospital, Observatory, Cape Town :—

DEPARTMENT OF RADIOTHERAPY

MEDICAL PRACTITIONER (Grade E), with salary £1860 p.a. (fixed).

MEDICAL PRACTITIONER (Grade D), with salary £1740 p.a. (fixed).

In addition to the basic salary, a cost-of-living allowance at rates prescribed from time to time by the Administrator is payable to whole-time officials, at present amounting to £234 for a married man and nil for a single person.

The conditions of service are governed by the relevant Ordinances and Regulations as well as the agreement entered into between the Cape Provincial Administration and the University of Cape Town.

The Joint Medical Staff is required to serve jointly the Provincial Administration and the University of Cape Town.

QUALIFICATIONS

Grade E : Must have not less than 3 years experience after registration as a Specialist in Radiotherapy.

Grade D : Must be registered as a Specialist in Radiotherapy.

The successful applicants will be required to submit satisfactory birth and health certificates and their appointment will be subject to the following conditions :—

(i) Appointment will be on contract for 5 years in the case of a citizen of a Commonwealth Country or the Republic of Ireland and 6 years in the case of a citizen of European countries other than the United Kingdom and the Republic of Ireland.

(ii) Transport expenses (third class by rail overseas and second or cabin class steamship fare and first class by rail in the Union) necessarily incurred by the successful applicant and his family, if any, from place of residence to the place of employment in the Province will be defrayed by the Administration provided that, if the contract is broken within 1 year of the date of assumption of duty the person appointed must refund to the Administration the full amount paid in respect of transport expenses and if the contract is broken within 5 years of the date of assumption of duty in the case of a Commonwealth citizen and 6 years in the case of a citizen of another European country, the person appointed shall refund to the Administration the pro rata share of the full amount above referred to in respect of the unexpired period.

(iii) The persons so appointed will be offered permanent appointments during the term of contract but not earlier than 3 years or with effect from the conclusion of the contract, provided they have passed an examination in Afrikaans as second language, which examination shall not be lower than the standard required for the Junior Certificate Examination of the Department of Education of the Cape Province and provided further that their services and conduct during the period of contract are satisfactory and their state of health is such as will enable them to continue to discharge efficiently all the duties of the posts in which they will be employed.

Application must be made in duplicate on the prescribed form, Staff 23, which is obtainable from the Staff Clerk, Room 309, South Africa House, Trafalgar-square, London, W.C.2.

The completed application forms must be addressed to the Director of Hospital Services, P.O. Box 2060, Cape Town, South Africa, and must reach him not later than 23rd June, 1956.

Candidates must state the earliest date on which they can assume duty.

AUSTRALIA. ROYAL SOUTH SYDNEY HOSPITAL, Joynton-avenue, ZETLAND, SYDNEY, AUSTRALIA. Applications are invited for the position of MEDICAL SUPERINTENDENT of the above Hospital of 100 Beds and situated in an industrial area. Salary £A1505 4s.–£A2000 p.a., according to the number of years of experience. Accommodation available at Hospital for single man.

Applications, endorsed "Medical Superintendent," stating age, qualifications, experience and marital status, together with references to be forwarded to the undersigned not later than Saturday, 30th June, 1956.

R. T. WRIGHT, Secretary and Chief Executive Officer.

AUSTRALIAN RED CROSS SOCIETY, Adelaide, South AUSTRALIA. Applications are invited for the position of DIRECTOR of Blood Transfusion Services.

Salary : £2500 Australian with increments annually to £2850 Australian.

Qualifications : Applicant must possess a medical degree and be experienced in advanced blood grouping work in practice and theory.

The successful applicant will be in charge of the Red Cross Blood Centre, Adelaide, which contains the Central Donor Services and Laboratories, and will act in a consultative and advisory capacity on problems in this field throughout the State. Facilities for research will be available, including clinical study in hospitals. Passages paid to Australia and housing guaranteed.

Applications in duplicate, giving particulars of age, academic qualifications and experience, and names and addresses of 3 referees, and a recent photograph, should be addressed to the Agent General and Trade Commissioner for South Australia, Marble Arch, W.1. Closing date 13th June, 1956.

NEW ZEALAND. TAUMARUNUI HOSPITAL BOARD. Applications are invited from medical practitioners with qualifications registrable in New Zealand, for the position of Full-time PHYSICIAN to take full charge of medical patients admitted to the Taumarunui Public Hospital. Applicants should be eligible to qualify as a Junior Specialist under the Hospital Employment (Medical Officers) Regulations, 1952. A higher medical qualification is desirable. Salary scale £1290–£1590 plus cost-of-living bonus, the commencing salary in that scale to be determined by the Medical Officers Salaries Grading Committee. Full particulars of the duties of the position and the conditions of appointment are available on request, or from the office of the High Commissioner for New Zealand, Strand, London.

Applications, showing full particulars of qualifications, and experience, together with the names of 3 referees, should be forwarded to reach the Official Secretary, the Office of the High Commissioner for New Zealand, Strand, London, W.C.2, not later than 30th June. Envelopes should be marked "Physician, Taumarunui Hospital" in the top left-hand corner. S. A. PHILIP, Secretary.

Hospital Services : Junior Appointments

ALBERT DOCK ORTHOPÆDIC AND FRACTURE HOSPITAL, Alnwick-road, E.16. SEAMEN'S HOSPITALS GROUP. SENIOR HOUSE OFFICER for Receiving-room duties required on 3rd July. Post, which is normally resident, is recognised by the Royal College of Surgeons, and provides excellent experience in a wide variety of traumatic conditions received from the adjacent dockland and from shipping in the Port of London. Salary £745.

Applications, stating age, nationality, qualifications, and experience, with the names of 2 recent referees, should be sent to the Secretary, Dreadnought Seamen's Hospital, Greenwich, not later than 18th June.

BATTERSEA GENERAL HOSPITAL, Battersea Park, S.W.11. HOUSE SURGEON CASUALTY OFFICER (combined post), resident, vacant immediately. House Officer grade, not pre-registration. Not recognised for F.R.C.S.

Apply Hospital Secretary, enclosing copies of 2 recent testimonials.

BROMPTON HOSPITAL, S.W.3. Applications invited for following posts :—

NON-RESIDENT SURGICAL OFFICER (post graded as Senior House Officer or Registrar, according to qualifications and experience), for which there are 2 vacancies, for 6 months from 1st August, 1956, with eligibility for reappointment. Candidates must have held a resident hospital appointment.

RESIDENT HOUSE PHYSICIAN for which there are 3 vacancies, for 6 months from 1st August, 1956. Duties include work in Outpatient Department and wards, also 1 months duty at Frimley as occasion demands. Salary at the rate of £525 p.a.

Applications, stating age, qualifications with dates, nationality, and appointments held, together with copies of testimonials, by 9th June, 1956, to KENNETH A. F. MILES, House Governor.

BROMPTON HOSPITAL SANATORIUM, Frimley. Applications invited for post of RESIDENT HOUSE PHYSICIAN for 6 months commencing 1st August, 1956. Post graded as Senior House Officer.

Applications, stating age, qualifications with dates, nationality, and appointments held, together with copies of testimonials, by 9th June, 1956, to KENNETH A. F. MILES, House Governor.

Brompton Hospital, London, S.W.3.

CAMBERWELL HOSPITALS MANAGEMENT COM-MITTEE. Applications are invited for appointment to the undermentioned pre-registration House Officer positions, vacant from 1st July, 1956, at :—

(i) **Dulwich Hospital** (in association with King's College Hospital Medical School for student teaching purposes), **East Dulwich-grove, S.E.22**

(*a*) 2 posts of HOUSE OFFICER (general medical duties).
(*b*) 2 posts of HOUSE OFFICER (general surgical duties).

(ii) **St. Giles' Hospital, Camberwell, S.E.5**

(*a*) 1 post of HOUSE OFFICER (general medical duties).
(*b*) 1 post of HOUSE OFFICER (general surgical duties).
(*c*) 1 post of HOUSE OFFICER (orthopædic duties).

Applications, stating age, qualifications and details of previous post (if any), enclosing copy testimonials or names of 2 referees, to the Group Secretary, Camberwell Hospital Management Committee, Dulwich Hospital, not later than 12th June, 1956.

CONNAUGHT HOSPITAL, Walthamstow, E.17. (118 Beds.) 2 HOUSE SURGEONS required for 6 months (General Surgery and Special Departments). Recognised for F.R.C.S.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Hospital Management Committee, Forest Group, Langthorne-road, E.11.

CONNAUGHT HOSPITAL, Walthamstow, E.17. (118 Beds.) Applications are invited for the post of CASUALTY OFFICER AND DEPUTY RESIDENT SURGICAL OFFICER (graded as Senior House Officer), vacant 9th June, 1956. Recognised for F.R.C.S. Salary £745 p.a., less £150 p.a. for board, lodging, &c.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Hospital Management Committee, Forest Group, Langthorne-road, E.11.

CONNAUGHT HOSPITAL, Walthamstow, E.17. (118 Beds.) Applications are invited for the post of RESIDENT ANÆSTHETIST (graded Senior House Officer), vacant 4th July, 1956. Salary £745 p.a., less £150 p.a. for board, lodging, &c. Recognised for D.A. and F.F.A.R.C.S.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, should be sent immediately to Secretary, Hospital Management Committee, Forest Group, Langthorne-road, E.11.

COLINDALE HOSPITAL, Colindale-avenue, London, N.W.9. (300 Beds.) SENIOR HOUSE OFFICER (resident when on duty), required at above Hospital to assist in thoracic, orthopædic and genito-urinary surgery.

Apply, stating age, qualifications and experience, and giving the names and addresses of 2 referees, to Group Secretary, Hendon Group Hospital Management Committee, Edgware General Hospital, by 16th June, 1956.

CHARTERHOUSE RHEUMATISM CLINIC (Independent of National Health Service), 56/60, Weymouth-street, London, W.1. (Branches at Croydon and Ilford.) Applications are invited for the post of SENIOR REGISTRAR (full- or half-time), non-residential, for 1 year renewable. Applicants should be Members of the Royal College of Physicians.

Applications, giving age, qualifications and experience, should be sent to the Secretary to the Board of Governors, 56/60, Weymouth-street, London, W.1.

EASTMAN DENTAL HOSPITAL AND INSTITUTE OF DENTAL SURGERY (UNIVERSITY OF LONDON), Gray's Inn-road, W.C.1. Applications are invited for the whole-time appointment of ANÆSTHETIST in the grade of Registrar, commencing 1st September, 1956. Remuneration and conditions of service in accordance with national scale for hospital medical staff.

Application forms are obtainable from the Director to whom they should be returned by 1st July, 1956.

GERMAN HOSPITAL, London, E.8. (General—157 Beds.) Applications for 6 months appointment of registered HOUSE PHYSICIAN (resident).

Applications to Group Secretary, Hackney Hospital, E.9, by 8th June, 1956, quoting GH/HP.

GERMAN HOSPITAL, London, E.8. (General—157 Beds.) Applications are invited for the 6-month resident appointment, now vacant, of Pre-registration HOUSE SURGEON, and should be sent immediately to Group Secretary, Hackney Hospital, London, E.9, quoting GH/PHS.

GORDON HOSPITAL, Vauxhall Bridge-road, S.W.1. WESTMINSTER HOSPITAL TEACHING GROUP. Applications are invited for the post of RESIDENT SURGICAL OFFICER (Registrar grade) for 1 year in the first instance, starting early in July.

Applications (3 copies), with the names of 2 referees, should be sent to the Secretary, The Gordon Hospital, within 1 week of the appearance of this advertisement.

HACKNEY HOSPITAL, London, E.9. (General—841 Beds.) Applications for the 6-months resident appointment of Pre-registration HOUSE PHYSICIAN (first post) should be sent to Secretary, above address, by 8th June, quoting HH/PHP.

HAMPSTEAD GENERAL HOSPITAL, Haverstock Hill, N.W.3. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from registered medical practitioners for the post of RESIDENT CASUALTY OFFICER (graded as Senior House Officer). Salary £745 p.a., tenable for a period of 6 months at the main Outpatient Department, Bayham-street, N.W.1.

Application forms may be obtained from the Secretary, to whom they should be returned, together with copies of 3 recent testimonials, by 7th June, 1956.

HAMPSTEAD GENERAL HOSPITAL, Haverstock Hill, N.W.3. (ROYAL FREE HOSPITAL GROUP.) Applications are invited for the pre-registration post of NON-RESIDENT CASUALTY OFFICER (medical or surgical). Vacant 1st July, 1956. Tenable for a period of 6 months.

Application forms may be obtained from the Secretary, to whom they should be returned, together with copies of 3 recent testimonials, by 7th June, 1956.

HIGHLANDS GENERAL HOSPITAL, Winchmore Hill, London, N.21. ANÆSTHETIST (House Officer grade), resident. 100 active surgical and orthopædic beds, approximately 1200 operations annually.

Applications, with copies of 3 testimonials, and name and address of 1 referee, to Hospital Secretary.

HIGHLANDS GENERAL HOSPITAL, Winchmore Hill, London, N.21. HOUSE SURGEON required. Duties mainly orthopædic with some E.N.T., casualty and emergency general surgery. New Operating Theatre, Outpatient and Casualty Departments. Preference given for applicants seeking pre-registration post under Medical Act, 1950.

Applications, with copies of 3 testimonials and name and address of 1 referee, to Hospital Secretary.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, London, N.W.8. Required, to commence on Monday, 16th July. Full-time SURGICAL REGISTRAR (Male). The possession of the Diploma of Fellow of 1 of the Royal Colleges is desirable. Honorarium at the rate of £750 p.a. Appointment will be for a period of 12 months.

Further particulars may be obtained from the Secretary to whom applications, with names of 3 referees, should be sent on or before Thursday, 7th June, 1956.

HAMMERSMITH HOSPITAL AND POSTGRADUATE MEDICAL SCHOOL, Ducane-road, London, W.12. Whole-time NON-RESIDENT REGISTRAR (radiotherapy) required.

Applications, stating age, qualifications, experience, names of 2 referees, to Secretary, Board of Governors, by 11th June.

KING EDWARD MEMORIAL HOSPITAL, Ealing. SENIOR HOUSE OFFICER (anæsthetics) for duties at King Edward Memorial Hospital and associate hospitals. Resident. Vacant now. A resident Registrar Anæsthetist is employed. Post recognised for D.A. and F.F.A.R.C.S. examinations.

Applications, stating age, nationality, qualifications and experience with copies of up to 3 recent testimonials, to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 13th June, 1956.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. A vacancy occurs 1st July, 1956, for RESIDENT SURGICAL OFFICER. Appointment for 6 months, with prospect of renewal. Post graded as Senior House Officer or Registrar, according to qualifications and experience. Previous surgical experience necessary.

Applications, stating date of birth, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should be forwarded at once to THOMAS BROWN, House Governor, London Chest Hospital, E.2.

LONDON CHEST HOSPITAL. Hospitals for Diseases of THE CHEST. 2 vacancies occur 1st August, 1956, for RESIDENT HOUSE PHYSICIAN. Appointments for 6 months, 4 in London, 2 at the Country Branch, near Letchworth, and post graded as House Officer. Duties include work in the Outpatient Department and refill clinic as well as in wards.

Applications, stating date of birth, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 20th June.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the post of SENIOR REGISTRAR to the Skin Department. Candidates must be Members of the Royal College of Physicians, London.

Applications (12 copies), giving the names and addresses of 3 referees, should reach the undersigned by 15th June, 1956.

H. BRIERLEY, House Governor.

LONDON JEWISH HOSPITAL, Stepney Green, E.1. (130 Beds.) HOUSE SURGEON (pre- or post-registration) required for 6 months commencing 17th June, 1956.

Applications, stating age, qualifications, experience and copies of testimonials, to be sent to the Hospital Secretary.

MEMORIAL HOSPITAL, Woolwich, S.E.18. House SURGEONS. 2 posts vacant end of June. Recognised for F.R.C.S. and approved for Pre-registration Service.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

METROPOLITAN HOSPITAL, Kingsland-road, London, E.8. (General—146 Beds.) Applications are invited for the pre-registration posts of 2 HOUSE PHYSICIANS and 3 HOUSE SURGEONS, vacant 1st July, 1956.

Applications, stating age, nationality, qualifications or probable date of qualifications and experience, with copies of 3 recent testimonials, to the Hospital Secretary by 14th June, 1956.

METROPOLITAN HOSPITAL, Kingsland-road, London, E.8. (General—146 Beds.) Applications are invited from registered medical practitioners for the post of RESIDENT SENIOR HOUSE OFFICER (casualty), vacant 5th August, 1956. Post recognised for F.R.C.S.

Applications, stating age, nationality, qualifications and experience, together with 3 testimonials, to the Hospital Secretary, by 14th June, 1956.

METROPOLITAN HOSPITAL, Kingsland-road, London, E.8. (General—146 Beds.) Applications are invited from registered medical practitioners for the post of RESIDENT SENIOR HOUSE OFFICER (anæsthetist), vacant 11th July, 1956.

Applications, stating age, nationality, qualifications and experience, together with 3 testimonials, to the Hospital Secretary by 14th June, 1956.

MILDMAY MISSION HOSPITAL, Austin-street, Bethnal Green, London, E.2. Applications are invited for the pre-registration post of RESIDENT HOUSE PHYSICIAN AND CASUALTY OFFICER, vacant 16th July, 1956. Salary £425, £475 or £525 p.a., according to experience, less £125 for residence. Candidates should be in sympathy with the evangelical aims of the Hospital and preference will be given to intending medical missionaries.

Applications and references to be addressed to the Medical Superintendent.

MOTHERS' HOSPITAL (Salvation Army), Clapton, E.5. (Maternity—110 Beds.) Applications are invited for the following 6-months resident posts :—

(*a*) Registered OBSTETRIC HOUSE SURGEONS (2 posts), vacant 1st August and 1st September.

(*b*) Pre-registration OBSTETRIC HOUSE SURGEON (second post), vacant 1st September.

Posts recognised for M.R.C.O.G.

Apply Secretary, Hackney Hospital Management Committee, London, E.9, quoting MH (*a*) or (*b*).

NATIONAL HOSPITALS FOR NERVOUS DISEASES. HOUSE OFFICER (resident), medical or surgical, to the Neurosurgical Department at the Maida Vale Hospital for Nervous Diseases, London, W.9. Appointment in the first instance for 6 months, duties to commence on 31st July, 1956, or earlier by agreement. Grading as Senior House Officer or Registrar, according to experience.

Applications, with copies of 3 recent testimonials, to be sent to the Secretary, Maida Vale Hospital for Nervous Diseases, W.9, not later than 13th June, 1956.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited from registered medical practitioners for the appointment of REGISTRAR (non-resident) at The National Hospital, Queen-square, W.C.1. This post carries the grade of Senior Registrar. Previous neurological experience and higher medical qualification are desirable. The appointment will be for 1 year in the first instance.

Applications, with names of 3 referees, to be sent to the undersigned not later than 23rd June, 1956.

H. EWART MITCHELL, Secretary to the Board of Governors.

The National Hospitals for Nervous Diseases,
Queen-square, London, W.C.1.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. Applications are invited from qualified medical practitioners for appointment as RESIDENT JUNIOR HOUSE SURGEON (pre-registration, first or second post) for a period of 6 months, commencing 15th July, 1956.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, to be returned by 23rd June, 1956.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. (248 Beds.) Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER RESIDENT SENIOR HOUSE SURGEON, for a period of 6 months, vacant 18th June, 1956.

Application form from Secretary, Tottenham Group Hospital Management Committee (Group No. 4), The Green, N.15, to be returned by 11th June, 1956.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. Applications are invited from registered medical practitioners for the appointment of RESIDENT SENIOR HOUSE PHYSICIAN (third post) to above Hospital for a period of 6 months from 8th July, 1956.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, to be returned by 16th June, 1956.

ROYAL FREE HOSPITAL GROUP. Applications are invited for the post of RESIDENT MEDICAL OFFICER to work at the North Western Branch of the Royal Free Hospital. Terms and conditions of service in accordance with the scale laid down by the Ministry of Health for Junior Hospital Medical Officers. Duties, which are for 6 months in the first instance, to commence 1st October, 1956.

Application forms may be obtained from the Secretary, The Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 30th June, 1956.

ROYAL FREE HOSPITAL GROUP. Applications are invited for the post of RESIDENT PATHOLOGIST (House Officer), vacant 1st September, 1956, from registered Men and Women practitioners. The post is for 6 months renewable for a further 6 months. Salary and conditions of service in accordance with the scale laid down by the Ministry of Health for House Officers.

Application forms may be obtained from the Secretary, Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 30th June, 1956.

ROYAL FREE HOSPITAL GROUP. Applications are invited for the post of Locum MEDICAL REGISTRAR at the Royal Free Hospital, Lawn Road Branch. The appointment is for 6 months in the first instance duties to commence 1st August, 1956. Terms and conditions of service in accordance with the scale laid down by the Ministry of Health for Locum Registrars.

Formal applications, giving details of experience, &c., together with the names of 3 referees, should be sent to the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1, not later than 23rd June, 1956.

ROYAL NORTHERN HOSPITAL, Holloway, London, N.7. HOUSE SURGEON required 18th July, 1956. Preference given to pre-registration candidates. Recognised for F.R.C.S.

Applications, with copies of recent testimonials, to be sent to the Hospital Secretary by 12th June, 1956.

ST. ANDREW'S HOSPITAL, Bow, E.3. Applications are invited for the appointment of HOUSE SURGEON to the Obstetric and Gynæcological Department. Recognised pre-registration post. Vacant on 4th July, 1956. Post is tenable for 6 months.

Applications, stating age and qualifications, with copies of at least 1 testimonial, should be sent immediately to the Hospital Secretary, St. Andrew's Hospital, Bow, E.3.

ST. ANN'S GENERAL HOSPITAL, N.15. Applications are invited from registered medical practitioners for the appointment of RESIDENT HOUSE SURGEON (third post) to above Hospital for a period of 6 months from 20th May, 1956.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15.

ST. CHARLES' HOSPITAL, Ladbroke-grove, London, W.10. (581 Beds.) Applications are invited for the undermentioned posts commencing 1st July :—

2 HOUSE SURGEONS (general), both pre-registration.
2 HOUSE PHYSICIANS (general), both pre-registration.
1 HOUSE PHYSICIAN (paediatrics).

Applications, stating age, qualifications, experience together with names and addresses of 2 referees, to be forwarded to Hospital Secretary by 14th June.

ST. NICHOLAS HOSPITAL, Plumstead, S.E.18. House SURGEONS. 2 posts vacant 1st July. Recognised for F.R.C.S. and approved for Pre-registration Service.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. House PHYSICIAN (general medicine), resident. Post-registration. Vacancy end of July.

Applications now, naming 2 referees, to Medical Superintendent.

ST. LEONARD'S HOSPITAL, Nuttall-street, London, N.1. (Acute General—192 Beds.) Applications are invited from registered or provisionally registered practitioners for the post of HOUSE SURGEON for 6 months, commencing 1st July, 1956.

Applications, with 2 recent testimonials, to be sent to the Hospital Secretary as soon as possible.

ST. MARY ABBOTS HOSPITAL, Marloes-road, Kensington, W.8. FULHAM AND KENSINGTON HOSPITAL MANAGEMENT COMMITTEE. Qualified medical practitioners are invited to apply for the following vacancies :—

HOUSE PHYSICIANS (2 vacancies). Provisionally registered candidates eligible.

HOUSE SURGEONS (2 vacancies). Provisionally registered candidates eligible. Appointments recognised for F.R.C.S.

HOUSE SURGEON (obstetrics and gynæcology). Post recognised for D.Obst.R.C.O.G. in obstetrics.

Appointments commence 1st August, 1956, are resident and limited to 6 months.

Applications by 15th June, 1956, on forms obtainable from the Hospital Secretary (L.61).

ST. MARY'S HOSPITAL, W.2. Applications are invited from suitably qualified general medical practitioners for appointment as Part-time MEDICAL OUTPATIENT ASSISTANT for 1 session per week (Wednesday, P.M.) as from 1st August, 1956. Preference will be shown to applicants who are below the age of 40 years and in practice in the neighbourhood of St. Mary's Hospital. The appointment is for a first period of 12 months ; remuneration to be at the rate of £175 p.a.—i.e., graded General Practitioner.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, details and National Health Service gradings of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, by 20th June, 1956.

ST. MARY'S HOSPITAL, W.2. Applications are invited from suitably qualified Male candidates for the post of Whole-time REGISTRAR in the Venereal Diseases Department. The appointment is for a first period of 12 months as from a date to be arranged, the holder being eligible for re-election.

Applications, stating nationality, date of birth, qualifications, details of experience, together with dates and National Health Service gradings of previous and present appointments and names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 12th June, 1956.

ST. MATTHEW'S HOSPITAL, Shepherdess-walk, London, N.1. SENIOR HOUSE OFFICER required (post vacant 18th June, 1956) for the above Hospital (Geriatric Unit 320 Beds), which has an active Rehabilitation Unit. Resident medical staff consists of a Senior Hospital Medical Officer, a Registrar and a Senior House Officer. Consultants visit regularly. The Hospital possesses most facilities for investigation and diagnosis.

Applications to the Hospital Secretary by 11th June, 1956.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for 2 appointments as Whole-time REGISTRARS in Orthopædic Surgery to fill vacancies in the approved trainee establishment at the following Groups of hospitals respectively :—

(1) Seamen's.

(2) Orpington and Sevenoaks.

The appointments will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience, with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 16th June, 1956.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Obstetrics and Gynæcology to fill a vacancy in the approved trainee establishment at the Woolwich Group of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience, with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 16th June, 1956.

SOUTH LODGE HOSPITAL, World's End-lane, N.21. RESIDENT SENIOR HOUSE OFFICER required. General duties, mainly surgical, as directed by the Medical Superintendent. Vacant now.

Applications, with the names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, Chase Farm Hospital, The Ridgeway, Enfield, Middlesex.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy on 1st October, 1956, for a RESIDENT OFFICER to the Neurological and Neurosurgical Department (Senior House Officer).

Further particulars and form of application, which must be returned not later than 18th June, 1956, may be obtained from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy on 8th September, 1956, for an ASSISTANT RESIDENT MEDICAL OFFICER (grade—Senior House Officer) at the Country Branch Hospital, Tadworth, Surrey (101 Beds).

Further particulars and form of application, which must be returned not later than Monday, 18th June, 1956, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

SOUTH WESTERN HOSPITAL, Landor-road, S.W.9. HOUSE PHYSICIAN (registered or pre-registration) required at the above Hospital. Combined tuberculosis and acute medicine. Post vacant July, 1956.

Form of application from the Secretary.

TAVISTOCK CLINIC, 2, Beaumont-street, London, W.1. Applications are invited for the posts, commencing 1st September, 1956, of 2 Whole-time REGISTRARS (psychotherapy). Posts are for those intending to specialise in psychotherapy and good general experience in psychiatry required. Preference given to candidates possessing D.P.M. Successful applicants offered personal analysis free of cost during appointment.

Application forms obtainable from, and returnable to, Secretary to the Committee, Paddington Group Hospital Management Committee, Harrow-road, W.9, by 18th June, 1956.

UNIVERSITY COLLEGE HOSPITAL, Gower-street, London, W.C.1. Applications are invited for the post of MEDICAL REGISTRAR from 1st October, 1956, for 1 year only. Preference will be given to candidates holding higher qualifications.

Applications, with the names of 2 referees, to Administrator and Secretary by 16th June.

UNIVERSITY COLLEGE HOSPITAL, Gower-street, W.C.1. Applications are invited for the post of REGISTRAR in the Department of Psychological Medicine from 1st July, 1956.

Applications, with names of 2 referees, to Administrator and Secretary by 16th June, 1956.

WANDSWORTH HOSPITAL GROUP. South West METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR (obstetrics and gynæcology) in Group Maternity Unit. Post vacant 1st July—recognised for M.R.C.O.G. Duties at St. James' Hospital and Weir Maternity Hospital.

Application forms (send stamped addressed large foolscap envelope) obtainable from Group Secretary, St. James' Hospital, Balham, S.W.12, to be completed and returned by 16th June.

WANDSWORTH HOSPITAL GROUP. Locum Registrar (obstetrics and gynæcology) required for Group Maternity Unit, from 1st July until permanent appointment is made. Duties at St. James' Hospital and Weir Maternity Hospital.

Applications, giving full details and names of 2 referees, to Group Secretary, St. James' Hospital, Balham, S.W.12, by 11th June.

WANSTEAD HOSPITAL, Hermon Hill, Wanstead, E.11. (191 Beds.) HOUSE PHYSICIAN required. Post vacant 10th July, 1956.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

WEST LONDON HOSPITAL, Hammersmith-road, W.6. RESIDENT CASUALTY OFFICER (Senior House Officer grading), required. Post vacant 25th July.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Secretary by 11th June.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. 2 MEDICAL REGISTRARS required, for 1 year in first instance from 13th August, 1956.

Applications (8 copies), with names of 2 referees, to House Governor by 16th June.

WHITTINGTON HOSPITAL, N.19. (1073 Beds.) North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in Anæsthetics. Regional training scheme includes facilities for gaining experience in specialist techniques at Regional Centres for plastic and thoracic surgery. Possession of higher qualification in anæsthetics desirable. Hospital (recognised for F.F.A.R.C.S. and D.A.) may be visited by direct appointment.

Application forms obtainable from, and returnable to, the Group Secretary, 46, Cholmeley-park, London, N.6, by 11th June, 1956.

WIMBLEDON HOSPITAL, Thurstan-road, S.W.20. Resi-DENT MEDICAL OFFICER (Senior House Officer), vacant 1st July.

Applications, giving full particulars of experience, &c., with copies of testimonials and the names of 2 referees, should be sent to the Group Secretary, St. Helier Hospital, Carshalton, Surrey.

ABERDEEN GENERAL HOSPITALS BOARD OF MANAGEMENT. WOODEND GENERAL HOSPITAL. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER in the Thoracic Surgery Department of the above Hospital. The post, which is non-resident, is subject to the conditions of service issued by the Department of Health for Scotland.

Applications, giving details of qualifications and experience, and the names of 2 referees, should be lodged with the Secretary, Aberdeen General Hospitals, 62, Queen's-road, Aberdeen, within 14 days of the appearance of this advertisement.

ANGUS, AND STRACATHRO AND BRECHIN HOSPITALS BOARDS OF MANAGEMENT. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER to the Angus Tuberculosis Hospitals and Clinics, under the control of the Area Chest Physician, with duties at Stracathro, Noranside and Whitehills Hospitals, as required. Clinic, domiciliary and laboratory experience will also be afforded. Salary scale £775–£50 (6)–£1075 p.a. Unmarried accommodation can be provided in Stracathro Hospital, but the Officer appointed may live out, if desired.

Applications, naming 3 referees, should be addressed to the Group Medical Superintendent, Arbroath Infirmary, Angus, to reach him within 10 days of the appearance of this notice.

ALTON GENERAL HOSPITAL. (136 Beds.) House SURGEON (Senior House Officer grade) required to assist in steadily expanding surgical work including casualty at this Hospital which is being developed. Post vacant middle of August.

Applications, with copies of 2 testimonials, to be sent to the Group Secretary, Winchester Group of Hospitals, Royal Hampshire County Hospital, Winchester.

ASHINGTON HOSPITAL, Ashington, Northumberland. (55 Beds.) HOUSE OFFICER (pre-registration), required on or about 7th July. The post is predominantly surgical but some medical work will need to be undertaken.

Applications, with names of referees, should be forwarded to—

J. J. BRENNAND, Secretary,
Wansbeck Hospital Management Committee.
12, Stanley-street, Blyth, Northumberland.

ASHTON, HYDE AND GLOSSOP HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (obstetrics/gynæcology) required. Post recognised for D.Obst.R.C.O.G., vacant 28th June, 1956. Preference given to pre-registration candidates.

Applications, with copies of 2 testimonials, should be addressed to the Group Secretary, General Hospital, Ashton-under-Lyne, Lancashire.

AYLESBURY, BUCKINGHAMSHIRE. STOKE MANDEVILLE HOSPITAL. RESIDENT HOUSE PHYSICIAN required for the Department of General Medicine. Recognised pre-registration post. Applications from registered practitioners will be considered. Post vacant 27th July, 1956.

Apply, with copies of 2 testimonials, to Administrative Officer.

BARNSTAPLE. NORTH DEVON INFIRMARY. (105 Beds.) HOUSE SURGEON (pre-registration). Post vacant mid-July.

Applications to Group Secretary, North Devon Hospital Management Committee 19, Alexandra-road, Barnstaple.

BARNSTAPLE. NORTH DEVON INFIRMARY. (105 Beds.) HOUSE PHYSICIAN (pre-registration). Post vacant early July.

Applications to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

BARROW-IN-FURNESS. NORTH LONSDALE HOSPITAL. Applications are invited for the resident post of SENIOR HOUSE OFFICER (medical) at the North Lonsdale Hospital, Barrow-in-Furness. National conditions and salary scale.

Applications to the Group Secretary, Barrow and Furness Hospital Management Committee, 105, Abbey-road, Barrow-in-Furness.

BASINGSTOKE, HAMPSHIRE. PARK PREWETT HOSPITAL. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of SENIOR PSYCHIATRIC REGISTRAR at Park Prewett Hospital (1490 Beds). Candidates should possess the D.P.M. and have had considerable experience in psychiatry. Residential accommodation is available to a single man.

Application forms can be obtained from the Group Secretary, Park Prewett Hospital, and should be returned not later than 14 days after the appearance of this advertisement. Applicants may visit the Hospital by appointment.

BASINGSTOKE, HAMPSHIRE. PARK PREWETT HOSPITAL. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER at the above Mental Hospital. All forms of modern treatment are used and opportunity will be given for varied experience in all branches of psychiatry. The Hospital is recognised by the London University and Royal Colleges for the D.P.M. Salary and conditions of service in accordance with national scale. Residential accommodation is available to a single person at a charge of £150 p.a.

Applications, with full particulars and names and addresses of 2 referees, should be sent to the Group Secretary, Park Prewett Hospital, Basingstoke.

BATH. ST. MARTIN'S HOSPITAL. Applications are invited from registered medical practitioners for the post of RESIDENT PATHOLOGIST at above Hospital. The officer's duties are mainly in the Area Blood Bank at that Hospital, with duties at Regional Blood Bank, Bristol, and at Bath Central Laboratory. The post is graded Senior House Officer.

Applications, stating age, qualifications and experience with names of 2 referees, should be forwarded to Group Secretary, Bath Hospital Management Committee, Manor Hospital, Combe Park, Bath.

BATLEY, YORKSHIRE. THE GENERAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER (resident) which is available immediately. The Hospital has 99 Beds which are allocated to the specialties of general surgery, E.N.T., orthopædics and ophthalmology.

Apply in writing to the Administrative Officer, enclosing copies of 2 testimonials.

BEBINGTON, CHESHIRE. CLATTERBRIDGE HOSPITAL. (783 Beds.) CENTRAL WIRRAL GROUP. HOUSE OFFICERS for pre-registration posts—6 months commencing 1st September, 1956.

General Medicine—5 posts.
Paediatrics—1 post (recognised for D.C.H.).
Salary according to previous posts held.

Application forms obtainable from Hospital Secretary, to be returned by 14th June, 1956.

BEDFORD GENERAL HOSPITAL. (437 Beds.) House SURGEON required. The appointment offers exceptional opportunities for general experience in busy acute surgical units.

Applications, stating age, experience, nationality, copies of 2 recent testimonials, to Group Secretary, 3, Kimbolton-road, Bedford.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER (pathology).

Apply, stating age, qualifications, experience, nationality, and names of 2 referees, to H. WILKINSON, Group Secretary.
Bury General Hospital, Bury, Lancs.

BURTON UPON TRENT. THE GENERAL HOSPITAL. HOUSE SURGEON required at the above Hospital as from 6th June, 1956. Post recognised for pre-registration purposes.

Apply Group Secretary.

BIRMINGHAM AND MIDLAND EAR AND THROAT HOSPITAL, Edmund-street, BIRMINGHAM, 3. SENIOR HOUSE OFFICER or HOUSE OFFICER (including pre-registration) required.

Apply to Group Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM AND MIDLAND EYE HOSPITAL, Church-street, BIRMINGHAM, 3. CLINICAL ASSISTANT required in Outpatient Department for 2 morning sessions a week (Mondays and Saturdays).

Detailed applications, with names of 2 referees, to Group Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM. DUDLEY ROAD HOSPITAL, Birmingham, 18. (780 Beds.) SENIOR HOUSE OFFICER (Casualty Department) required, vacant immediately (40,000 attendances per year). Resident or non-resident. Recognised for F.R.C.S. Tenable for 6 or 12 months.

Detailed applications, with copies of 2 recent testimonials, to Group Secretary.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **Birmingham No. 6 Group, Hollymoor Hospital, Norfield, Birmingham, 31**

REGISTRAR (resident/non-resident) for Rubery Hill Hospital (950 Beds). Experience in investigation, diagnosis and treatment all psychiatric illness. D.P.M. course, Birmingham University.

(2) **Coventry Group No. 20, Stoney Stanton-road, Coventry**

REGISTRAR (general medicine), for Gulson Hospital (312 Beds). Resident. Experience specialty essential.

(3) **Stoke-on-Trent Group, Princes-road, Stoke-on-Trent**

REGISTRAR (pathology), for City General Hospital (845 Beds), resident. Recognised for Dip.Path. Experience in all branches of clinical pathology available.

Application forms from Hospital Management Committee Secretaries, to be returned before 11th June, 1956.

BIRMINGHAM, 29. SELLY OAK HOSPITAL. (Equipped Beds 955.) HOUSE PHYSICIANS. HOUSE PHYSICIAN (pædiatrics); recognised for D.C.H., some duties at Moseley Hall Hospital for Children. HOUSE SURGEONS; recognised for F.R.C.S. HOUSE SURGEONS (gynæcology and obstetrics); recognised for M.R.C.O.G. All posts will be available on 14th July, and are recognised for Pre-registration Service. Tenable for 6 months.

Apply Medical Superintendent, giving qualifications, age and experience, and enclosing copies of 3 testimonials.

BIRMINGHAM, 29. SELLY OAK HOSPITAL. (955 equipped beds.) ASSISTANT CASUALTY OFFICER (Senior House Officer), resident/non-resident. Vacant 14th July, 1956. Recognised for F.R.C.S. Residential charge £167 p.a.

Applications, giving qualifications, experience and age, with copies of 3 recent testimonials, to Medical Superintendent.

BIRMINGHAM, 13. SORRENTO MATERNITY HOSPITAL. (106 Beds, including 24 premature baby cots.) OBSTETRIC HOUSE SURGEON. Recognised for the D.Obst.R.C.O.G. Hospital affiliated to Birmingham Medical School for training of students. Vacant 1st August, 1956.

Apply Obstetrician by 13th June, 1956.

BIRMINGHAM. ST. CHAD'S HOSPITAL, Hagley-road, BIRMINGHAM, 16. HOUSE SURGEON required from 7th July, 1956. Recognised for pre-registration.

Detailed applications, with recent testimonials, to Group Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM. ST. CHAD'S HOSPITAL, Hagley-road, BIRMINGHAM, 16. HOUSE PHYSICIAN required from 7th July, 1956. Recognised for pre-registration.

Detailed applications, with recent testimonials, to Group Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. Applications are invited for the appointment of SURGICAL REGISTRAR (Registrar grade) to the Surgical Professorial Unit, United Birmingham Hospitals. Candidates must have held a resident appointment and should hold at least a primary Fellowship qualification and they may be required to be resident.

Forms of application from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15, to be returned by 9th June, 1956.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE BIRMINGHAM AND MIDLAND HOSPITAL FOR WOMEN, Showell Green-lane, SPARKHILL, BIRMINGHAM, 11. RESIDENT GYNÆCOLOGICAL HOUSE SURGEON required for 7th July, 1956. Post recognised for M.R.C.O.G.

Application forms obtainable from the House Governor, to be returned immediately.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS, THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER to work in the Clinical Pathological Department, vacant 11th July, 1956, for 1 year. Applicants should have held resident appointments in a children's hospital or a children's department of a general hospital.

Forms of application may be obtained from the House Governor and should be returned by 12th June, 1956.

G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS, THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Applications are invited for the post of RESIDENT SURGICAL OFFICER (Registrar) vacant 1st August, 1956, for 1 year. Preference will be given to applicants with a knowledge of pædiatric surgery and who hold a higher qualification. Deduction of £150 from salary for residential emoluments.

Forms of application may be obtained from the House Governor and should be returned by 12th June, 1956.

G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Applications are invited for the appointment of RESIDENT MEDICAL OFFICER in the grade of Senior House Officer, vacant 1st July, 1956, for 1 year. Previous experience in children's diseases preferable but not essential.

Forms of application may be obtained from the House Governor and should be returned to him immediately.

G. A. PHALP, Secretary to the Board of Governors.

BISHOP AUCKLAND, co. DURHAM. THE GENERAL HOSPITAL. (350 Beds.) HOUSE PHYSICIAN required. Registered practitioner or pre-registration post. Vacant end of June.

Apply, naming 2 referees, to K. G. T. LUXFORD, Group Secretary, South West Durham Hospital Management Committee, at the above address.

BLACKBURN (near). BROCKHALL HOSPITAL FOR MENTAL DEFECTIVES, LANGHO, near BLACKBURN, LANCS. RESIDENT MEDICAL OFFICER required (Junior Hospital Medical Officer). 2159 Beds in modern and fully equipped colony, excellent facilities for gaining experience of mental deficiency practice. National Health Service conditions. Salary £775–£50–£1075. Accommodation (modern flat) available for single or married man or woman.

Applications, with usual particulars, to be sent to the Medical Superintendent. M. LAWRENCE,

Secretary of the Hospital Management Committee.

BLACKBURN. QUEEN'S PARK HOSPITAL. House OFFICER (obstetrics and gynæcology) required for busy unit of 58 Beds taking normal and abnormal cases at above Hospital. Post vacant 27th June, 1956. Recognised for D.Obst.R.C.O.G.

Apply to Secretary, Blackburn and District Hospital Management Committee, Hospital Management Committee Office, Royal Infirmary, Blackburn, Lancs.

BLACKBURN. ROYAL INFIRMARY. (262 general beds.) JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER (casualty and orthopædics) required 25th June. Post recognised for F.R.C.S. Junior Hospital Medical Officer post can be for any period up to 4 years and a starting salary above the minimum of the scale may be approved on account of special experience or qualifications.

Apply to Secretary, Blackburn and District Hospital Management Committee, Hospital Management Committee Office, Royal Infirmary, Blackburn, Lancs.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road, BOSCOMBE. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT OBSTETRIC OFFICER for post becoming vacant on 14th July, 1956. There are 36 obstetric and 31 gynæcological beds and the appointment is recognised for the M.R.C.O.G. and the D.Obst.R.C.O.G., but not for pre-registration purposes.

Applications to the Hospital Secretary.

BRISTOL. COSSHAM FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (general surgery) required for duties at Cossham Memorial Hospital and at Frenchay Hospital, Bristol. Resident appointment, unmarried accommodation only.

Applications, naming 2 referees, to the Group Secretary, Frenchay Hospital, Bristol.

BRISTOL. MANOR PARK HOSPITAL. (750 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER. Salary £775–£50–£1075. Furnished accommodation available, together with board and laundry, for which a charge of £120 p.a. is made. The Hospital caters for acute medical and chronic sick patients. Consultant staff visit regularly and there is ample time for postgraduate study.

Applications, stating age, nationality, whether married or single, experience, qualifications, and names and addresses of 2 referees, to be sent to the Group Secretary, Manor Park Hospital, Manor-road, Fishponds, Bristol, within 14 days of the appearance of this advertisement.

BRISTOL (near). HAM GREEN HOSPITAL, Pill, BRISTOL. Applications are invited for the post of RESIDENT ASSISTANT PHYSICIAN in the Infectious Diseases Department (350 Beds) of this Hospital. The Hospital contains a major Poliomyelitis Unit, a tuberculous meningitis treatment centre, and offers wide experience in acute medicine. Salary and conditions on Junior Hospital Medical Officer scale. House available.

Applications, stating age, qualifications, &c., to the Group Secretary, Ham Green Hospital, Pill, near Bristol.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL, BRIGHTON, 7. Locum JUNIOR HOSPITAL MEDICAL OFFICER as Senior Casualty Officer for period 11th–30th June.

Applications, stating usual particulars, to the Administrative Officer.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL; BRIGHTON GENERAL HOSPITAL. 2 RESIDENT ANÆSTHETISTS (Senior House Officer grade) required for 1 year—6 months at each Hospital, by interchange of duties, with facilities for working in specialised hospitals within the Brighton and Lewes Group. Posts recognised for F.F.A.R.C.S. and D.A., and vacant early July and mid-August.

Applications, stating age, nationality and experience, naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRIGHTON GENERAL HOSPITAL. House Physician (geriatrics). This is a large Unit with an active rehabilitation section, which provides excellent clinical facilities. Vacant 18th July.

Applications, stating age, qualifications, and experience, together with copies of recent testimonials, should be sent to the Physician-Superintendent, Brighton General Hospital, Elm-grove, Brighton, 7.

BRIGHTON GENERAL HOSPITAL. House Surgeon for Surgical Unit of 60 Beds. Vacant 17th June, 1956. The post is recognised as a pre-registration appointment.

Applications, stating age, qualifications, experience, and giving the names of referees, should be sent to the Physician-Superintendent, Brighton General Hospital, Elm-grove, Brighton, 7.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 Beds.) ORTHOPÆDIC HOUSE SURGEON (first, second, or third post). Married accommodation available. Offers good opportunity for general experience in busy acute general hospital. Approved pre-registration post. Fully qualified practitioners may apply. Recognised for F.R.C.S. Vacant now.

Apply to Group Secretary.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. ASSISTANT PATHOLOGIST (Senior House Officer grade) required in Area Laboratory with attendance at Branch Laboratory, Driffield. Offers experience all branches of pathology. Salary £745.

Detailed applications to Group Secretary.

CAERPHILLY DISTRICT HOSPITAL, near Cardiff. (226 general beds.) RHYMNEY AND SIRHOWY VALLEYS HOSPITAL MANAGEMENT COMMITTEE. Vacancies for SENIOR HOUSE OFFICER (general surgery) on 1st July, 1956, and for 2 Pre-registration HOUSE SURGEONS, 1 on 1st July, 1956, and the other on 1st August, 1956.

Apply, stating age, qualifications, and names of 2 referees, to Group Secretary, Hospital Management Committee, Central Offices, Caerphilly-road, Ystrad Mynach, Hengoed, Glamorgan.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. Medical REGISTRAR (non-resident) for 1 year in first instance, vacant late June, renewable for second year.

Apply, with full particulars and names of 3 referees, to Secretary by 16th June.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. GynæcoLOGICAL HOUSE SURGEON for 6 months from 1st August, 1956. Second or subsequent post. Recognised for Pre-registration Service and M.R.C.O.G.

Apply, stating age, nationality, qualifications and experience with dates, and copies of 3 testimonials, to Secretary by 16th June. Interviews late June.

CANTERBURY (near). ST. AUGUSTINE'S HOSPITAL, CHARTHAM, near CANTERBURY. Locum Tenens SENIOR REGISTRAR (full-time) required at this Mental Hospital—£24 per week. Accommodation available for single person.

Apply to Physician-Superintendent.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) GYNÆCOLOGICAL HOUSE SURGEON required at Highland Court Annexe, a unit of 25 gynæcological beds situated 3 miles from the above Hospital, with all ancillary services available. Recognised for M.R.C.O.G. 6 months appointment. Post vacant early July, 1956. National Health Service salary and conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CARDIFF. ST. DAVID'S HOSPITAL. (640 Beds.) Senior HOUSE OFFICER (resident or non-resident) required for Geriatric Unit at above Hospital.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF. THE UNITED CARDIFF HOSPITALS. Applications are invited for the appointment of SENIOR REGISTRAR in the Department of Diagnostic Radiology. Candidates must hold a Diploma in Medical Radiology.

Application forms can be obtained from the Secretary to the Board, United Cardiff Hospitals, Cardiff Royal Infirmary, and should be returned within 14 days of the appearance of this advertisement.

CASTLEFORD, NORMANTON AND DISTRICT HOSPITAL, HIGHTOWN, CASTLEFORD. RESIDENT SURGICAL OFFICER (Senior House Officer grade), required. Married accommodation available.

Applications should be forwarded, as soon as possible, to the Secretary, Great Northern House, Salter-row, Pontefract, Yorkshire.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL. (404 Beds.) Applications are invited for the post of SENIOR MEDICAL REGISTRAR which becomes vacant mid-June. The Hospital may be visited by arrangement with the Physician-Superintendent.

Application forms can be obtained from, and should be returned within 14 days of the appearance of this advertisement to, the Group Secretary, Woking and Chertsey Hospital Management Committee, "Huntington," Guildford-road, Chertsey.

CROYDON GENERAL HOSPITAL. (200 Beds.) Croydon GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. CASUALTY REGISTRAR, post vacant. Senior Casualty Officer in a busy department. Post recognised for Final F.R.C.S. examination. Accommodation may be inspected on application to Hospital Secretary.

Application forms obtainable from Group Secretary, Hospital Management Committee, General Hospital, Croydon, to be returned within 14 days.

CROYDON GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR (whole-time) for Group duty, vacant 3rd August, 1956. Post resident or non-resident (accommodation may be inspected on application to Hospital Secretary). Duties mainly at Croydon General Hospital (200 Beds) and Mayday Hospital (611 Beds). Candidates must have experience in anæsthetics and possession of D.A. an advantage. Post recognised for F.F.A.R.C.S. and D.A.

Application forms obtainable from Group Secretary, Hospital Management Committee, General Hospital, Croydon, to be returned within 14 days.

CROYDON GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR (whole-time) for Group duty, vacant now. Post resident or non-resident (accommodation may be inspected on application to Hospital Secretary). Duties mainly at Croydon General Hospital (200 Beds) and Mayday Hospital (611 Beds). Candidates must have experience in anæsthetics and possession of D.A. an advantage. Post recognised for F.F.A.R.C.S. and D.A.

Application forms obtainable from Group Secretary, Hospital Management Committee, General Hospital, Croydon, to be returned within 14 days.

CARLISLE. CUMBERLAND INFIRMARY. (335 Beds.) Applications are invited for the appointment of SENIOR HOUSE OFFICER ("Specials"—i.e., E.N.T. and Eyes).

Applications, giving 2 names for reference purposes, should be sent to the Group Secretary, East Cumberland Hospital Management Committee, Cumberland Infirmary, Carlisle.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. REGISTRAR in the Department of Physical Medicine (non-resident). Post vacant mid-August.

Forms of application, returnable by 14th June, obtainable from the Group Secretary, at the above address.

CHELMSFORD HOSPITALS. Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer) to large surgical units, for a period of 12 months.

Applications, stating age, qualifications and experience, with recent testimonials, should be sent to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

CHELMSFORD. ST. JOHN'S HOSPITAL. House PHYSICIAN (pre-registration, first, second, or third appointment), Male or Female, to commence as soon as possible.

Applications, stating age, nationality, qualifications, and experience, together with recent testimonials, to the Secretary, Group Hospital Management Committee, Chelmsford and Essex Hospital, London-road, Chelmsford.

CHELTENHAM GENERAL AND EYE HOSPITAL. (170 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (casualty) required.

Applications, giving details of qualifications and experience and names of 3 referees, to be sent to the Group Secretary, General Hospital, Sandford-road, Cheltenham.

CHELTENHAM GENERAL HOSPITAL. (220 Beds.) Applications are invited for the appointment of HOUSE PHYSICIAN (pre-registration). The post is resident and will be vacant about the middle of June. Salary and conditions of service in accordance with the National Health Service regulations.

Applications together with 2 testimonials, should be sent to—
STANLEY T. DAVIS, Secretary.
General Hospital, Cheltenham.

CHELTENHAM GENERAL HOSPITAL. (220 Beds.) HOUSE SURGEON required pre- or post-registration. The post offers a wide experience in general surgery, gynæcology, and orthopædic surgery. Post recognised for the F.R.C.S.

Apply Secretary, General Hospital, Cheltenham.

CHESTERFIELD ROYAL HOSPITAL. (324 Beds. Recognised for the D.A. and F.F.A.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (anæsthetics) with additional duties when required at other hospitals in the group. Experience in all types of anæsthesia, except for neurosurgery, can be obtained in this Group of hospitals. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 11th June, 1956, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

DERBY. DERBYSHIRE ROYAL INFIRMARY. House PHYSICIAN (pre-registration), vacant 1st July, 1956.

Apply, stating full particulars with copies of 2 recent testimonials, to Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. House SURGEON (pre-registration) or SENIOR HOUSE OFFICER (general surgery), vacant 4th July, 1956.

Apply, stating full particulars with copies of 2 recent testimonials, to Secretary.

DEVIZES, WILTSHIRE. ROUNDWAY HOSPITAL. (For Nervous and Mental Diseases—1334 Beds.) Applications are invited for the appointment of a JUNIOR HOSPITAL MEDICAL OFFICER for duty at the above Mental Hospital. All forms of modern treatment available, including Insulin Unit and outpatient clinics at 3 General Hospitals. Salary £775 p.a., rising by £50 to £1075 p.a. Accommodation for a single man for which £150 p.a. will be charged, or furnished house for a married man available at a rent of £3 per week plus rates.

Applications, giving names and addresses of 2 referees, to the Medical Superintendent as soon as possible.

DONCASTER ROYAL INFIRMARY. Applications are invited for the post of SENIOR HOUSE OFFICER in Ophthalmology. Recognised for D.O.

Applications to the Group Secretary, Doncaster Hospital Management Committee, at Doncaster Royal Infirmary.

DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP, BIRMINGHAM REGION.

The Guest Hospital, Dudley (154 Beds)
SENIOR HOUSE OFFICER (casualty). Post now vacant.
SENIOR HOUSE OFFICER (anæsthetics). Post now vacant.
HOUSE OFFICER (surgical), pre-registration. Post vacant July.

Wordsley Hospital, near Stourbridge (478 Beds)
HOUSE OFFICER (surgical), pre-registration. Post vacant July.

The Corbett Hospital, Stourbridge (114 Beds)
HOUSE OFFICER (surgical), pre-registration. Post vacant June.

Apply, Group Secretary, Guest Hospital, Dudley.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. SURGICAL REGISTRAR (casualty). Peterborough Memorial Hospital (150 Beds). 6 months of tenure recognised for F.R.C.S. Appointment for 1 year, renewable for second year.

Applications, stating age, experience, and the names of 3 referees, to the Board's Senior Administrative Medical Officer, 117, Chesterton-road, Cambridge, by 18th June, 1956. Candidates invited to visit Hospital by direct arrangement with Hospital Management Committee Secretary at the Hospital.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR, United Norwich Hospitals. Ward duties at West Norwich Hospital and Norwich Isolation Hospital and outpatient clinics at Norfolk and Norwich Hospital. Post provides wide experience in general medicine. Appointment for 1 year, renewable for second year.

Applications, stating age, experience and the names of 3 referees, to the Board's Senior Administrative Medical Officer, 117, Chesterton-road, Cambridge, by 11th June, 1956. Candidates invited to visit hospitals by direct arrangement with Hospital Management Committee Secretary, Norfolk and Norwich Hospital, Norwich.

EAST LOTHIAN HOSPITALS GROUP BOARD OF MANAGEMENT. EAST FORTUNE HOSPITAL. RESIDENT HOUSE OFFICER required immediately. Male or Female. Appointment for 6 months. Post recognised for Pre-registration Service (medical). 300 Beds tuberculosis and chest; offers excellent experience.

Applications, giving names of 2 referees, immediately to Secretary, East Lothian Hospitals Group Board of Management, 31, Court-street, Haddington.

EDINBURGH. ROYAL HOSPITAL FOR SICK CHILDREN. Applications are invited from registered medical practitioners and pre-registration graduates for the post of Locum HOUSE OFFICER in the above Hospital for a period of 3 months commencing on 1st July, 1956.

Applications to be submitted immediately to Medical Superintendent, Edinburgh Central Hospitals, 18, Rillbank-terrace, Edinburgh, 9, giving full particulars of qualifications and experience and the names of 2 referees.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. RESIDENT HOUSE SURGEON required 1st July, for Orthopædic, E.N.T. and Eye Departments. Pre-registration post.

Applications, stating age, qualifications and experience with copies of 2 recent testimonials, should be sent immediately to Group Secretary at above address.

EXETER. ROYAL DEVON AND EXETER HOSPITAL. Applications are invited from pre-registration and registered medical practitioners for the post of HOUSE SURGEON (general surgery) vacant 18th June, 1956.

Applications, with copies of recent testimonials, to the Hospital Secretary by 9th June, 1956.

FAREHAM, HAMPSHIRE. KNOWLE HOSPITAL. KNOWLE GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER at above Hospital, where all forms of modern psychiatric treatment are undertaken. Previous psychiatric experience is not essential, as training facilities will be available. Terms and conditions of service will be as approved for hospital medical staff employed in the National Health Service. Salary £775–£50–£1075 p.a. A house will be made available on the estate for married candidates.

Applications should be sent as soon as possible to the Physician-Superintendent, Knowle Hospital, Fareham, Hants.

GRIMSBY HOSPITAL MANAGEMENT COMMITTEE. 2 HOUSE PHYSICIANS (pre-registration or fully registered) or SENIOR HOUSE OFFICERS (medicine) required at end of July; 1 for Scartho Road Hospital and 1 for Grimsby General Hospital. Units of 51 and 56 Beds respectively. Medical Library and reading facilities available.

Applications for either post, with names of 2 referees, to the Secretary, Grimsby General Hospital, Grimsby, Lincs.

GRIMSBY. SPRINGFIELD HOSPITAL. (210 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT REGISTRAR (chest and infectious diseases) required. House available. There is a Thoracic Unit at the Hospital. Some clinic work would be undertaken under Consultant supervision. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10, by 11th June, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (233 Beds.) SENIOR HOUSE OFFICER for ophthalmology and neurology. Post is vacant on 13th June, resident accommodation is available, it is tenable for 6 months and renewable. Whitley Council terms. Recognised for both the F.R.C.S. and D.O. examinations.

Apply as soon as possible, with copies of 3 testimonials, to the Hospital Secretary.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (233 Beds.) SENIOR HOUSE OFFICER required 7th July for E.N.T. Department. Post recognised for D.L.O. examination.

Applications, with copies of 3 testimonials, should be sent to the Hospital Secretary as soon as possible.

GLASGOW, N. STOBHILL GENERAL HOSPITAL. PSYCHIATRIC UNIT. HOUSE OFFICER (resident), Male or Female, required. 180 Beds. 1600 admissions yearly, acute treatable cases. Unit recognised for D.P.M.

Apply to Medical Superintendent.

GLASGOW. VICTORIA INFIRMARY, Langside, Glasgow. General Surgery. SENIOR HOUSE OFFICER required at above Infirmary.

Applications, with names of 2 referees, to the Secretary, Board of Management for Glasgow Victoria Hospitals, 24, St. Vincent-place, Glasgow, C.1.

GLASGOW. HAWKHEAD (MENTAL) HOSPITAL, 510, Crookston-road, GLASGOW, S.W.3. Applications are invited for the post of SENIOR HOUSE OFFICER in Psychiatry (Male or Female), resident or non-resident. The post offers wide experience and training in all aspects of psychiatry (in-patient and outpatient), and all modern methods of treatment are carried out. Recognised for D.P.M.

Applications, together with the names of 2 referees, should be forwarded as soon as possible to Physician-Superintendent at above address.

GLASGOW NORTHERN HOSPITALS BOARD OF MANAGEMENT. Applications are invited for a SENIOR HOUSE OFFICER (Male or Female) for the Psychiatric Unit at Stobhill Hospital, Glasgow. Resident preferred. The Unit consists of 180 Beds with 1600 admissions yearly and deals with acute treatable cases; it is recognised for the D.P.M. The appointment will be for 1 year in the first instance.

Applications, stating age, qualifications, experience and present appointment, and naming 3 referees, to be lodged immediately with the Secretary, 13, Woodside-place, Glasgow, C.3.

GLASGOW ROYAL INFIRMARY. Senior House Officer in Surgery. Duties at above Infirmary.

Write, giving 3 names for reference, not later than 7th June, 1956, to the Secretary, Board of Management for Glasgow Royal Infirmary and Associated Hospitals, 135, Buchanan-street, Glasgow, C.1.

HASTINGS AND ST. LEONARDS. BUCHANAN HOSPITAL. (94 Beds.) Locum SENIOR HOUSE OFFICER (urology), 18th June–1st July. Salary £14 10s. per week, less £2 17s. 8d. for full board.

Apply, with names of 3 referees, to Hospital Administrator.

HASTINGS GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics) for duties within the Group. Post, now vacant, is recognised for the D.A. Salary £745 p.a.

Apply to Group Secretary, 11, Holmesdale-gardens, Hastings.

HASTINGS. ST. HELEN'S HOSPITAL. (495 Beds.) HOUSE SURGEON (pre-registration). Post now vacant.

Apply to Hospital Administrator.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited for appointment of HOUSE SURGEON—general, gynæcology and obstetrics (first or second post). Recognised under F.R.C.S. regulations, pre-registration post. Duties to commence 16th June, 1956.

Applications to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) RESIDENT CASUALTY OFFICER (Senior House Officer grade) with attachment to Psediatrician and Ophthalmic Consultant. Salary £745 p.a., less £130 p.a. residential emoluments. Recognised under F.R.C.S. regulations. Appointment to commence 25th June, 1956.

Apply, with full details and references, to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HITCHIN HOSPITALS, Hitchin, Hertfordshire. Resident ANÆSTHETIST (Senior House Officer) required 1st July, 1956. The post offers varied experience, and is recognised for the D.A. and F.F.A.R.C.S. examinations.

Applications, stating age, nationality, qualifications and experience, together with names of 2 referees, to be sent to the Medical Administrator, Lister Hospital, Hitchin, as soon as possible.

HOUNSLOW HOSPITAL, Staines-road, Hounslow, MIDDLESEX. (General Acute—81 Beds.) Applications are invited for the appointment of RESIDENT HOUSE SURGEON. Recognised pre-registration appointment for 6 months. Post now vacant.

Applications, stating qualifications and age, together with copies of up to 3 recent testimonials, or names for reference, to the Hospital Secretary.

HUDDERSFIELD ROYAL INFIRMARY. (312 Beds.) Applications are invited from provisionally registered or registered medical practitioners for the post of HOUSE PHYSICIAN, to commence duties on 12th June, 1956. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary,
Huddersfield Hospital Management Committee.

The Royal Infirmary, Huddersfield.

HUNTINGDON COUNTY HOSPITAL. Applications are invited for the post of HOUSE OFFICER (surgical), vacant mid-June. Post recognised for pre-registration purposes.

Apply, with full particulars and names of 2 referees, to Secretary, County Hospital, Huntingdon.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in Surgery at above Hospital, vacant 1st September. Hospital may be visited by appointment with Medical Director (Tel. HOUnslow 2311).

Application forms obtainable from, and returnable to, Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 12th June.

IVYBRIDGE, SOUTH DEVON. MOORHAVEN HOSPITAL. JUNIOR HOSPITAL MEDICAL OFFICER required not later than September. Flat available for a married man. Post offers full training in psychiatry. Hospital provides comprehensive mental health service for Plymouth Clinical Area. Medical staff of 8; 780 Beds. Admissions in 1955 numbered 670 and outpatient attendances 4500.

Further particulars, application form and 1955 Annual Report from Physician-Superintendent.

ILFORD. KING GEORGE HOSPITAL, Eastern-avenue. There will be vacancies for the following at above Hospital:—

HOUSE SURGEON, 14th June, 1956 (second post pre-registration).

HOUSE SURGEON, 15th July, 1956 (first or second post pre-registration).

The posts will be tenable for 6 months.

Applications, giving full particulars and accompanied by testimonials, should be sent to the undersigned within 7 days of the appearance of this advertisement.

H. F. HARRIS, Group Secretary, Ilford
and Barking Group Hospital Management Committee.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE SURGEON to the E.N.T. and Ophthalmic Departments, vacant on 13th June, 1956. The post is recognised for pre-registration and for the D.L.O. examination.

Applications, giving full particulars and copies of recent testimonials, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE SURGEON to the Fracture and Orthopædic Department, vacant on 13th June, 1956. Approved pre-registration post.

Applications, with copies of recent testimonials, to the Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE SURGEON to the General Consultant Surgeon, vacant now. The post is recognised for pre-registration and for the F.R.C.S. examinations.

Applications, with copies of recent testimonials, to the Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL. Heath ROAD WING, IPSWICH. (270 Beds.) Applications invited for 2 posts of HOUSE SURGEON (pre-registration), to General Surgeons. Now vacant. Recognised for R.C.S. examinations.

Applications, with full details, and copies of recent testimonials, to Hospital Secretary.

KENDAL. WESTMORLAND COUNTY HOSPITAL. (82 Beds.) SENIOR HOUSE OFFICER (obstetrics and gynæcology). The post is resident or non-resident, and normally tenable for 1 year. Successful applicant will be attached to the Specialist Unit.

Applications, with full particulars and names of 2 referees, to be addressed to Group Secretary, Royal Lancaster Infirmary, Lancaster.

LANCASTER. ROYAL LANCASTER INFIRMARY. (233 Beds.) SENIOR HOUSE OFFICER (medical). Duties include care of acute cases under the supervision of 2 Consultant Physicians and attendance at Consultative Clinics. The post is normally tenable for 1 year.

Applications, with names of 2 referees, to be addressed to the Group Secretary, Royal Lancaster Infirmary.

LEEK (near). ST. EDWARD'S HOSPITAL, Cheddleton, near LEEK, STAFFS. JUNIOR HOSPITAL MEDICAL OFFICER. Previous experience not essential. This Hospital offers opportunities for gaining experience in all branches of psychiatry. Terms and conditions of service will be as approved for hospital medical staff employed in the National Health Service. Salary £775–£50–£1075. Single furnished quarters or unfurnished house on Hospital estate available.

Applications as soon as possible to the Medical Superintendent.

LEICESTER ISOLATION HOSPITAL AND CHEST UNIT, Groby-road, LEICESTER. (328 Beds.) Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER (surgical), becoming vacant on 23rd June, 1956. Salary £745 p.a., less £150 residential emoluments. The appointment is tenable for 6 months, and may be extended for a further period of 6 months. Experience will be gained in all branches of thoracic surgery, including cardiac surgery. The post is recognised for the Final Fellowship.

Applications, giving age, qualifications, dates, &c., and copies of 2 recent testimonials, to be forwarded as soon as possible to the Department of Thoracic Surgery at the above Hospital.

LEICESTER ROYAL INFIRMARY. Locum Tenens SENIOR HOUSE OFFICER (obstetrics and gynæcology) required from 29th July to 11th August inclusive. Senior Registrar on establishment.

Apply Secretary.

LINCOLN COUNTY HOSPITAL. (200 Beds.) Applications are invited from pre-registration candidates for an appointment as HOUSE SURGEON for 6 months to be followed, if satisfactory, by an appointment as House Physician for a further 6 months.

Apply, giving full particulars, to—
R. W. HOWICK, Group Secretary.

AMENDED ADVERTISEMENT

LINCOLN. LAWN HOSPITAL, Union-road. (Mental Hospital for Private Patients—100 Beds.) LINCOLN NO. 2 HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER (full-time or Locum Tenens). Salary and conditions of service in accordance with latest recommendations of Whitley Council. A small flat is available.

Apply as early as possible to the Medical Superintendent.

LIVERPOOL, 6. NEWSHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER (dermatology), resident or non-resident. The post is vacant on 1st July and is tenable for 12 months. The Dermatological Department has an outpatient clinic dealing with approximately 50,000 attendances annually and 170 Beds are available for inpatient treatment. The successful candidate may be required to devote a portion of time to medical wards. Salary £745 p.a., less £130 p.a. if resident.

Applications to the Physician-Superintendent as soon as possible.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for a post of SENIOR HOUSE OFFICER in Ophthalmology at St. Paul's Eye Hospital for the period to 30th September, 1956.

Apply by 13th June on form obtainable from the Secretary, 80, Rodney-street, Liverpool, 1.

LEEDS REGIONAL HOSPITAL BOARD. Short-term LOCUM TENENS appointments in the Registrar grade are constantly available at hospitals in the area of the Board, particularly in the specialties of anæsthetics, general medicine, general and orthopædic surgery, and psychiatry.

Interested practitioners, suitably experienced, should communicate with the Secretary, Joint Registrars Committee, Park-parade, Harrogate.

MAIDENHEAD HOSPITAL, St. Luke's-road, Maidenhead. RESIDENT SURGICAL REGISTRAR required at above Hospital which may be visited by direct appointment.

Application forms from, and returnable to, Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 8th June.

MAIDENHEAD HOSPITAL, Berkshire. Applications invited from registered practitioners for post of CASUALTY OFFICER, vacant now. Post recognised for F.R.C.S. Salary on House Officer scale plus £50 p.a.

Applications, stating age, qualifications and nationality, with copies of testimonials or names of 3 referees, to Secretary.

MAIDSTONE. KENT COUNTY OPHTHALMIC AND AURAL HOSPITAL. (113 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE SURGEON in the E.N.T. Department of the above Hospital. Post vacant now. There are 55 E.N.T. beds and 6 specialist operating sessions each week. Valuable experience is available, and the post is recognised for the purpose of the F.R.C.S. and the D.L.O. Salary will be £745 a year, less £150 a year for residential emoluments.

Applications immediately to the Administrative Officer, Kent County Ophthalmic and Aural Hospital, Maidstone, Kent.

MANCHESTER AND SALFORD HOSPITAL FOR SKIN DISEASES, Quay-street, MANCHESTER, 3. SALFORD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (resident). The appointment is for a period of 12 months.

Applications, stating age, qualifications with dates, nationality, and accompanied by copies of 2 recent testimonials, to be sent immediately to the Hospital Secretary.

MANCHESTER, 20. CHRISTIE HOSPITAL AND HOLT RADIUM INSTITUTE. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (surgery) at the above Hospital. This is a suitable post for candidates studying for the F.R.C.S.

Applications, stating age, qualifications, nationality, present post, experience, and names of 2 referees, to the Group Secretary, Withington Hospital, Manchester, 20, as soon as possible.

MANCHESTER. DUCHESS OF YORK HOSPITAL FOR BABIES, LEVENSHULME, MANCHESTER, 19. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required for 12 months, resident or non-resident. Post is the senior of 3. D.C.H. or M.R.C.P. an advantage but not essential. The Hospital is associated with the University Department of Child Health for teaching purposes.

Applications immediately, stating age, qualifications, experience, and the names of 2 referees, to the Group Secretary, Withington Hospital, Manchester, 20.

MANCHESTER, 19. THE DUCHESS OF YORK HOSPITAL FOR BABIES. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. There will be a vacancy at the above Hospital, which is associated with the Manchester University for teaching purposes, for a RESIDENT HOUSE OFFICER (Male or Female), post- or second pre-registration, for 6 months commencing 1st July, 1956.

Applications, with copies of 3 testimonials, to be sent to the Administrative Officer at the above address.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. REGISTRAR to Department of Anæsthetics, to commence on 15th August, 1956. Whole-time, non-resident post, tenable for 12 months, renewable.

Application to be made on form obtainable from the undersigned and to be returned not later than 9th June, 1956.

G. H. TAYLOR, Secretary.

MANCHESTER, 23. WYTHENSHAWE HOSPITAL. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade), vacant 30th July. The post offers facilities for experience in all branches of pathology; previous experience in the specialty is not essential.

Applications, stating age, experience, qualifications, and the names of 2 referees, to the Group Secretary, Withington Hospital, Manchester, 20.

MANCHESTER. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (anæsthetics) with duties in the South Manchester Group. This post is recognised by the Royal College of Surgeons for the F.F.A.R.C.S. and for the D.A.

Applications, stating age, qualifications, present post, experience, and names of 2 referees, to be forwarded immediately to the Group Secretary, Withington Hospital, Manchester, 20.

MANCHESTER REGIONAL HOSPITAL BOARD and THE BOARD OF GOVERNORS OF THE UNITED MANCHESTER HOSPITALS. SENIOR REGISTRAR in Paediatrics at the Royal Manchester Children's Hospital, Pendlebury, and St. Mary's Hospitals, Manchester. Post vacant 1st September, 1956.

Forms of application obtainable from the Senior Administrative Medical Officer, Manchester Regional Hospital Board, Cheetwood-road, Manchester, 8, should be returned by 18th June, 1956.

MANCHESTER REGIONAL HOSPITAL BOARD. Salford HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for post of RESIDENT ANÆSTHETIST (Registrar grade) in the above Group, vacant 1st August, 1956. The post is recognised for the D.A. Experience in the administration of anæsthetics for all types of surgery is available in the hospitals of the Group, namely, Salford Royal Hope, and the Royal Manchester Children's. Candidates wishing to take advantage of these facilities may do so.

Applications, together with copies of 2 recent testimonials, should be sent to the Group Secretary, Salford Royal Hospital, before 9th June, 1956.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for the following posts at Whittingham Hospital:—

REGISTRAR in Psychiatry.

SENIOR HOUSE OFFICER.

Comfortable furnished quarters are available with full residential emoluments at a charge of £140 p.a.

Applications, endorsed "Medical Officer" giving details and experience, and names and addresses of 3 referees, to be addressed to the Chairman, Whittingham Hospital, near Preston, and be received as soon as possible.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade), which will be vacant on 14th August, 1956. Previous experience in pathology not essential, the post affording opportunities for gaining experience in all branches of clinical pathology.

Applications, stating age, qualifications, present post, experience, and names of 2 referees, to be forwarded immediately to the Group Secretary, Withington Hospital, Manchester, 20.

MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT ANÆSTHETIST for joint duties at the West Kent General Hospital, and the Kent County Ophthalmic and Aural Hospital, Maidstone (total beds 254). The post, which is of Senior House Officer grade, will be vacant June, 1956, and carries a salary of £745 a year, less £150 for residential emoluments. Excellent experience under Consultant Anæsthetists is available, and the post is recognised for the F.F.A.R.C.S. examination.

Applications, stating age, nationality, qualifications and experience, together with the names of 2 suitable referees, should be forwarded to the Administrative Officer, West Kent General Hospital, Maidstone.

MORECAMBE. QUEEN VICTORIA HOSPITAL. (100 Beds.) RESIDENT SENIOR HOUSE OFFICER (obstetrics and gynæcology). The post vacant shortly and tenable for 1 year. Successful applicant will work with the Specialist Unit, but will be expected to relieve the Senior House Officer (surgical) during absence.

Applications, with full particulars, to Group Secretary, Royal Lancaster Infirmary, Lancaster.

MORECAMBE. QUEEN VICTORIA HOSPITAL. ResiDENT SENIOR HOUSE OFFICER (surgical). The post is normally tenable 1 year and the successful applicant will be attached to the specialist Surgical Unit.

Applications, with names of 2 referees, to be addressed to the Group Secretary, Royal Lancaster Infirmary, Lancaster.

NOTTINGHAM. CITY HOSPITAL. (811 Beds.) Sheffield REGIONAL HOSPITAL BOARD. Whole-time RESIDENT MEDICAL REGISTRAR required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 11th June, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

NOTTINGHAM. CITY HOSPITAL. (811 Beds.) Applications are invited for the post of HOUSE OFFICER (obstetrics and gynæcology), recognised for pre-registration purposes, which will be graded Senior House Officer or House Officer in accordance with experience. Recognised for the M.R.C.O.G. and D.Obst.R.C.O.G. Post vacant on 16th July, 1956.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM. CITY HOSPITAL. (811 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER to the Department of Thoracic Surgery. Post vacant now. Salary £745 p.a., less £150 p.a. for residential emoluments. The appointment will be for 1 year.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be submitted immediately to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM. HIGHBURY HOSPITAL. Senior MEDICAL HOUSE OFFICER required at the above Hospital, Resident. Duties to commence on or about 17th July, 1956. The successful candidate will, in addition to medical duties, have an opportunity of assisting in the Obstetric Unit. This post will be accepted as a general medical appointment entry to the M.R.C.O.G. examination.

Apply in writing, stating age, qualifications and experience, together with copies of testimonials, to the Group Secretary, General Hospital, Nottingham.

NOTTINGHAM. HIGHBURY HOSPITAL. Applications are invited from fully registered medical practitioners for the post of SENIOR HOUSE OFFICER in the Obstetrical and Gynæcological Department (41 obstetric beds, 11 gynæcological beds and a small block for puerperal pyrexia). The appointment is for a period of 12 months to commence 1st July. The Hospital is recognised for the M.R.C.O.G. (obstetrics only). Previous obstetric experience required.

Applications, stating age, qualifications, and experience also nationality, together with copies of recent testimonials, to be sent to Group Secretary, General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Resident Pre-registration HOUSE PHYSICIANS required. Duties to commence about end of June.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM. HEATHFIELD HOSPITAL (Infectious Diseases), Hucknall-road, NOTTINGHAM. Resident Locum MEDICAL OFFICER (Male or Female) required for holiday period of 8 weeks (July and August). Junior Hospital Medical Officer rate £17 10s. per week, less residential emoluments. Previous fever experience not essential.

Applications, with copies of 2 recent testimonials, as soon as possible to Physician-Superintendent.

NEWMARKET GENERAL HOSPITAL, Suffolk. Applications are invited for the post of HOUSE SURGEON, vacant 9th June, 1956. Duties include surgical House charge of general surgical E.N.T. and eye cases. Post resident and available for 6 months, recognised for pre-registration.

Applications, with copies of 3 testimonials, to the Medical Superintendent.

NEWTON ABBOT HOSPITAL. Locum Senior House OFFICER (medicine), required from 1st to 31st July, 1956, for above Hospital. Duties divided equally between 20 acute medical beds and 140 geriatric beds. Also required to stand in when Senior House Surgeon otherwise engaged. Married quarters available.

Applications, with copy testimonials, to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

NEWTON ABBOT HOSPITAL. (General Section—85 Beds.) RESIDENT SENIOR HOUSE SURGEON (Male or Female) required early June, 1956. Married quarters available.

Applications (quoting ref. F.364/35), stating qualifications, nationality, age, with copy testimonials, to be sent to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

REGISTRAR in Infectious Diseases and General Medicine (resident or non-resident), Rush Green Hospital, Romford, Essex. Regional Polio Unit (30 Beds) and approximately 10 medical beds. Excellent experience in wide variety of positive and negative pressure apparatus. Applicants may visit the Hospital by appointment (Tel. : Romford 7711).

Appointment subject to review after 1 year.

Application forms from Secretary, 11A, Portland-place, W.1, to be returned by 23rd June, 1956.

NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE AND HEXHAM AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. DEPARTMENTS OF OBSTETRICS AND GYNÆCOLOGY. Applications are invited for the following posts, vacant on 7th July, 1956 :—

(1) **Newcastle General Hospital** (838 Beds)

(*a*) Department of Obstetrics (70 Beds): HOUSE SURGEON (resident) pre-registration.

(*b*) Department of Gynæcology (30 Beds): HOUSE SURGEON (resident) pre-registration.

This department is recognised for the M.R.C.O.G., and D.Obst.R.C.O.G., and undertakes the training of medical students in the University of Durham. Preference will be given to provisionally registered candidates who have carried out their first house appointment. Consideration may be given to the possibility of alternating these posts.

(2) **Hexham General Hospital** (314 Beds)

Gynæcology : HOUSE SURGEON (resident), pre-registration. Recognised for M.R.C.O.G. Applications considered from final year students in anticipation of graduation.

(3) **Dilston Hall Maternity Hospital, Corbridge** (50 Beds)

Obstetrics : HOUSE SURGEON (resident), pre-registration. Recognised for D.Obst.R.C.O.G.

Applications, together with 1 copy of 2 recent testimonials, should be sent to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4, by 9th June, 1956.

NEWCASTLE REGIONAL HOSPITAL BOARD.

Newcastle General Hospital (838 Beds)

REGISTRAR OBSTETRICIAN AND GYNÆCOLOGIST (whole-time), resident, from 1st October, 1956. This is a combined appointment between Hexham (Dilston Hall Maternity Home—55 Beds) and Newcastle (100 obstetrical and gynæcological beds) with probably at least 6 months in each area. The General Hospital is a Teaching Unit. Post recognised for M.R.C.O.G. Single or married accommodation available.

Newcastle General Hospital

REGISTRAR PEDIATRICIAN (whole-time), resident. Children's Department closely associated with University Department of Child Health. Person appointed to take part in teaching ; also duties at the Hospital for Sick Children.

Amended Advertisement.

Regional Thoracic Service

REGISTRAR THORACIC SURGEON (resident), at Regional Thoracic Centre (150 Beds) Shotley Bridge General Hospital. Work almost entirely non-tuberculosis (cardiovascular, œsophageal and pulmonary) and at associated sanatoria. Higher qualification necessary and some experience in chest surgery an advantage. Appointment intended for trainee in thoracic surgery. Single accommodation available.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

Sedgefield Hospital Management Committee

Locum REGISTRAR OBSTETRICIAN AND GYNÆCOLOGIST (whole-time) from 1st July, 1956. Modern self-contained unfurnished flat (5 rooms) available.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6, immediately.

NEWCASTLE GENERAL HOSPITAL. (838 Beds). NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. The following posts become vacant on 7th July, 1956 (resident). Undergraduate teaching is conducted in most departments of the Hospital.

* HOUSE PHYSICIANS (4), General Medical Wards.
(2 of these posts rotate with the House Physician post in the Cardiovascular Department.)

* HOUSE PHYSICIAN (1), Cardiovascular Department.
(This post rotates with the 2 House Physician posts in general medicine.)

HOUSE PHYSICIANS (4), Pædiatrics. Hospital for Sick Children, Newcastle upon Tyne (2), and Children's Department, Newcastle General Hospital (2).

3 of the posts are for pre-registration candidates (M. and S.). The posts offer experience in the whole of the pædiatric work of the hospitals, including general medicine and surgery and the special departments. There is a close association with the University Department of Child Health.

* HOUSE PHYSICIAN (1), Geriatric Unit.

* HOUSE SURGEONS (2), General Surgery. (Recognised for the F.R.C.S. Diploma.)

* HOUSE SURGEON (1), Accident and Admission Department. (Recognised for F.R.C.S. Diploma.)

* These posts are recognised for the purpose of Pre-registration Service and applications will be accepted from students on the point of taking their qualifying examinations.

Applications, together with 1 copy of 2 recent testimonials, should be sent to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4, by 9th June, 1956.

PERTH. COUNTY AND CITY OF PERTH GENERAL HOSPITALS. The following House Officer posts will fall vacant on 1st August, 1956 :—

Bridge of Earn Hospital

*1 SENIOR HOUSE SURGEON (Fracture and Orthopædic Unit).
*3 HOUSE SURGEONS (Fracture and Orthopædic Unit).
*3 HOUSE SURGEONS (general surgical wards).
†1 HOUSE SURGEON (gynæcology and obstetrics).
‡1 SENIOR HOUSE SURGEON (E.N.T. ward).
1 SENIOR HOUSE PHYSICIAN (general medical wards).
3 HOUSE PHYSICIANS (general medical wards).

Perth Royal Infirmary

*2 HOUSE SURGEONS (general surgical wards).
*1 HOUSE SURGEON (casualty).
3 HOUSE PHYSICIANS (general medical wards).

Notes :

(1) Senior House Officer posts are tenable for 12 months and Junior House Officer posts for 6 months, with the exception of the Gynæcology and Obstetrics post shown under Bridge of Earn Hospital, this post is tenable for 12 months and consists of 6 months gynæcology at Bridge of Earn Hospital, followed by 6 months obstetrics at Perth Royal Infirmary.

(2) All Junior House Officer posts are recognised for Pre-registration Hospital Service.

(3) Posts marked * are recognised by the Royal College of Surgeons under the regulations for the F.R.C.S.

(4) Post marked † is recognised both for Gynæcology and Obstetrics under the regulations for the M.R.C.O.G. The Obstetrics post at Perth Royal Infirmary is also recognised for the Diploma in Obstetrics of the Royal College of Gynæcologists.

(5) Post marked ‡ is recognised under the regulations for the D.L.O.

Applications, giving details of age, qualifications, experience, and the names of 2 referees, should be sent to the Group Medical Superintendent, Perth Royal Infirmary, Perth.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL.

SENIOR HOUSE OFFICER in Surgery, vacant immediately. Recognised for the F.R.C.S. Greenbank Road Section.

SENIOR HOUSE OFFICERS in Anæsthetics, vacancies 1st September, 1st October, 1956. Recognised for the D.A. and F.F.A.R.C.S. The appointments will be for a period of 12 months. South Devon and East Cornwall Hospital, Plymouth.

HOUSE SURGEONS (pre-registration posts), vacancies June and 1st July, 1956. Recognised for the F.R.C.S. Greenbank Road Section.

Applications, stating age, nationality, qualifications and experience, with names of 3 referees, to be sent to—

ARTHUR R. CASH, Group Secretary, Plymouth.
South Devon and East Cornwall General Hospital Group.
7, Nelson-gardens, Stoke, Plymouth.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE. (316 Beds and large Outpatient Department. Committee's Base Hospital serving population of 174,000. Recognised for M.R.C.O.G., D.Obst.R.C.O.G., F.R.C.S., D.C.H., F.F.A.R.C.S., D.A.) RESIDENT SENIOR HOUSE OFFICER (surgical) to commence 24th July, 1956.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE. (316 Beds and large Outpatient Department. Committee's Base Hospital serving population of 174,000. Recognised for M.R.C.O.G., D.Obst.R.C.O.G., F.R.C.S., D.C.H., F.F.A.R.C.S., D.A.) RESIDENT SENIOR HOUSE OFFICER (obstetrics and gynæcology).

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd, as soon as possible.

POOLE GENERAL HOSPITAL, Longfleet-road, Poole. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. ANÆSTHETIC REGISTRAR required for the period 30th June–14th July, inclusive.

Applications to the Hospital Secretary.

POOLE GENERAL HOSPITAL, Longfleet-road, Poole. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Obstetrics and Gynæcology required for the period 25th June–9th July, inclusive.

Applications to the Hospital Secretary.

POOLE GENERAL HOSPITAL, Longfleet-road, Poole, DORSET. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT OBSTETRIC OFFICER (Senior House Officer) for post becoming vacant on 1st August, 1956. The Hospital is recognised for the D.Obst.R.C.O.G.

Applications to the Hospital Secretary.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

Royal Portsmouth Hospital (65 medical beds)

HOUSE PHYSICIAN (pre-registration post), vacant 1st July, 1956.

Saint Mary's Hospital

SENIOR HOUSE OFFICER (gynæcology) required. The department consists of 50 Beds and offers excellent facilities for training. Recognised for the M.R.C.O.G. Vacant 16th June, 1956.

Royal Portsmouth Hospital (Orthopædic Department 104 Beds)

HOUSE OFFICER (pre-registration), vacant now.

Applications, stating age, experience, and qualifications, together with names of 2 referees, should be forwarded as soon as possible to E. H. HURST.

35, Grove-road South, Southsea.

RAMSGATE. GENERAL HOSPITAL. (101 Beds.) House SURGEON. Approved pre-registration post. Salary at the rate of £425–£525 p.a., according to experience, less £125 for resident emoluments.

Applications, with copies of testimonials, to Hospital Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. (399 Beds.) Applications are invited from registered medical practitioners (Male or Female) for the appointment of a SENIOR HOUSE OFFICER (anæsthetics), vacant 1st August next for a period of 1 year. Post recognised for F.F.A.R.C.S. Salary £745 p.a., less £125 for board-residence.

Write, stating age, qualifications with dates, nationality and present post together with the names of 2 referees, to the Group Secretary, Reading and District Hospital Management Committee, 3, Craven-road, Reading.

RHYL. ROYAL ALEXANDRA HOSPITAL. (138 Beds.) Applications are invited for the appointment of CASUALTY OFFICER (Senior House Officer grade) at the above Hospital, commencing 1st August, 1956. Post recognised for F.R.C.S.

Applications, stating age, nationality, qualifications and experience, accompanied by copies of 2 recent testimonials, should be sent to the Group Secretary, Clwyd and Deeside Hospital Management Committee, "Rhianfa," Russell-road, Rhyl, within 10 days from the date of publication of this advertisement.

RICHMOND, SURREY. ROYAL HOSPITAL. Pre-registration HOUSE SURGEON required. Post vacant now.

Apply immediately to Administrative Officer.

ROCHDALE AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. HOUSE PHYSICIAN posts available at Birch Hill Hospital, mid-July. Pre-registration candidates eligible.

Apply at once to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (301 Beds.) GYNÆCOLOGICAL HOUSE SURGEON (Male or Female), required immediately. Unit comprises 35 gynæcological and 6 maternity beds. Resident post open to either pre-registration applicants or to fully qualified practitioners. Appointment includes certain relief duties on the medical side.

Applications to Medical Superintendent as soon as possible. Hospital may be seen by arrangement (Tel.: Romford 7711).

SALISBURY GENERAL HOSPITAL. Applications are invited for the post of RESIDENT or NON-RESIDENT CASUALTY OFFICER (Senior House Officer) for a period of 12 months. Post is recognised for F.R.C.S. and is vacant 9th July, 1956.

Applications, naming 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SALISBURY GENERAL HOSPITAL. Pædiatric House OFFICER, Odstock Hospital. 55 medical and surgical beds. Recognised for D.C.H. Vacant 25th July.

Applications, with names and addresses of 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SALISBURY GENERAL HOSPITAL. Applications are invited for the appointment of SENIOR HOUSE OFFICER to the E.N.T. Department. Post is recognised for D.L.O. and F.R.C.S.

Applications, naming 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury, Wilts.

SOUTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD. Applications are invited for 2 appointments as Whole-time REGISTRARS in Psychiatry to fill vacancies in the approved trainee establishment at Oakwood Hospital, Maidstone, Kent. Previous experience in general medicine is desirable. The appointments will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 16th June, 1956.

SOUTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD. Applications are invited for an appointment as Whole-time SENIOR REGISTRAR in Psychiatry to fill a vacancy in the approved trainee establishment at Hellingly Hospital, Hailsham, Sussex. Candidates should possess the D.P.M. and have had wide experience in general medicine. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance. The post will include opportunities for gaining further experience in a wide range of psychiatry including attendance at adult out-patient clinics. Accommodation is available for either a married or single applicant.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 3 referees, should be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 16th June, 1956.

SOUTHEND GENERAL HOSPITAL. Applications are invited from registered or provisionally registered practitioners for 2 RESIDENT HOUSE SURGEON appointments. Both posts vacant on 28th June, 1956. Salary according to previous appointments held, less prescribed charge for residential emoluments.

Applications, stating age, qualifications, and previous experience, with copies of recent testimonials (1 testimonial sufficient from applicants for first appointment) to reach the undersigned by 6th June, 1956. J. C. FIELD, Secretary.

SOUTHEND-ON-SEA. GENERAL HOSPITAL. Applica-tions are invited for the post of RESIDENT GYNÆCOLOGICAL HOUSE SURGEON, vacant 30th June, 1956. The post is recognised for M.R.C.O.G.

Applications, stating age, qualifications, and previous experience, with copies of recent testimonials, should reach the undersigned by 6th June. J. C. FIELD, Secretary.

SOUTHAMPTON GENERAL HOSPITAL. (471 Beds. Recognised for F.R.C.S.) RESIDENT HOUSE SURGEONS required beginning of June. Pre-registration candidates eligible.

Applications, with copies of recent testimonials, should be forwarded to Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. Dermatology. Applications are invited for the post of REGISTRAR in Dermatology (from 1st October, 1956) at Dundee Royal Infirmary, the main general teaching hospital (of 510 Beds) associated with the University of St. Andrews. Salary and conditions of service in accordance with national agreement.

Further particulars and forms of application from the Secretary to the Board, "Braeknowe," 430, Blackness-road, Dundee, with whom applications must be lodged not later than 16th June, 1956.

SCOTLAND. NORTH-EASTERN REGIONAL HOS-PITAL BOARD. Applications are invited for the post of SENIOR REGISTRAR in General Medicine—main duties in Aberdeen General Hospitals. The appointment is for a period of 1 year in the first instance.

Applications, giving 2 names for reference, should be submitted by 11th June, 1956, to the Secretary, 1, Albyn-place, Aberdeen, from whom further particulars may be obtained.

SCOTLAND. SOUTH-EASTERN REGIONAL HOS-PITAL BOARD. Applications are invited for the appointment of a REGISTRAR in Bacteriology to the Edinburgh Northern Group of hospitals, based on the Northern General Hospital, vacant on 1st October, 1956.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 2 referees, should be sent to the Secretary, South-Eastern Regional Hospital Board, 11, Drumsheugh-gardens, Edinburgh, 3, by 30th June.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments, which will be for 1 year in the first instance:—

SENIOR REGISTRAR in Radiotherapy based at the Western Infirmary, Glasgow.

SENIOR REGISTRAR in Ophthalmology for duties at the Victoria Infirmary and the Southern General Hospital, Glasgow.

REGISTRAR in Pathology based at Stobhill General Hospital, Glasgow.

REGISTRAR in Child Psychiatry based at the Department of Child Psychiatry, Royal Hospital for Sick Children, Glasgow.

REGISTRAR in Anæsthetics based at the Western Infirmary, Glasgow.

REGISTRAR in Surgery based at Stobhill General Hospital, Glasgow, with duties primarily at Falkirk and District Royal Infirmary.

These appointments are subject to the National Health Service (Scotland) superannuation regulations.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, by 16th June, 1956.

SCUNTHORPE. WAR MEMORIAL HOSPITAL. (262 Beds.) Vacancy for RESIDENT HOUSE SURGEON early June (Senior House Officer grade).

Applications, naming 2 referees, to Group Secretary, Scunthorpe Hospital Management Committee.

SHEFFIELD. CITY GENERAL HOSPITAL. (652 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON RESIDENT MEDICAL REGISTRAR required with duties also at Fir Vale Infirmary. General medical experience would be gained at the City General Hospital and geriatric experience at Fir Vale Infirmary. Post vacant 1st August. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 11th June, 1956, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD NATIONAL CENTRE FOR RADIOTHERAPY. SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT SENIOR HOUSE OFFICER or REGISTRAR in Radiotherapy required. (Possession of D.M.R.(T) Part I necessary to qualify for appointment as Registrar.) Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10, by 11th June, 1956, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT SENIOR REGISTRAR in Children's Psychiatry required for Mapperley Hospital, Nottingham (1115 Beds). D.P.M. essential. Appointment for 1 year in first instance, reviewable annually.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 18th June, 1956.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS SHEFFIELD REGIONAL HOSPITAL BOARD. REGISTRAR required at the Sheffield Centre for the Investigation and Treatment of Rheumatic Diseases. Duties to include clinical research.

☞ Applications, with the names of 3 referees, to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1, as soon as possible.

SHREWSBURY. ROYAL SALOP INFIRMARY. ORTHOPÆDIC/ACCIDENT HOUSE SURGEON (Senior House Officer). Successful applicant will be allowed to attend for 2 days a month at the Robert Jones and Agnes Hunt Orthopædic Hospital, Oswestry, for postgraduate study, with the Consultant. Post recognised under revised Fellowship regulations in respect of 6 months training required for the Final Fellowship examination. Vacant 24th July, 1956.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY AND CROSS HOUSES HOSPITAL. OBSTETRIC UNIT. OBSTETRIC HOUSE SURGEON. Duties to rotate between the 2 hospitals. Pre-registration post. Vacant 2nd July, 1956.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY/COP-THORNE HOSPITAL. (500 Beds.) HOUSE SURGEON, vacant 12th July, 1956. Pre-registration candidates eligible. Recognised for the F.R.C.S.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY/COP-THORNE HOSPITAL. (500 Beds.) Senior House Officer to work as CLINICAL PATHOLOGIST to Group Laboratory. Appointment tenable for 1 year, resident or non-resident, vacant 31st July, 1956. A Unit of the Public Health Laboratory Service is housed in the same building, and there are facilities for training in all the 4 main branches of pathology.

Applications to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury, naming 3 referees.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. WINDSOR GROUP HOSPITAL MANAGEMENT COMMITTEE. Locum SENIOR HOUSE OFFICER (obstetrics and gynæcology) required from 16th June to 13th July.

Applications, with names of 2 referees, to Secretary.

SEDGEFIELD. WINTERTON HOSPITAL MANAGE-MENT COMMITTEE. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (psychiatry) for a period not exceeding 4 years. The appointment offers valuable experience in all branches of psychiatry at this large mental hospital where all modern forms of treatment are carried out, both at inpatient and outpatient level. The Hospital is recognised for the D.P.M. Resident accommodation is available for married or single applicants at a very moderate charge. Conditions of service in accordance with the latest recommendations of the Whitley Council. Salary £775–£50–£1075.

Applications, stating full particulars of qualifications and experience, together with copies of 2 recent testimonials or names of 2 referees, should be forwarded to the Group Secretary, Winterton Hospital, Sedgefield, co. Durham, within 14 days from the date of this advertisement.

C. W. GILL, Group Secretary.

Winterton Hospital, Winterton, Sedgefield,
Stockton-on-Tees, co. Durham.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) HOUSE SURGEON (House Officer grade) required for general surgical team. Recognised for F.R.C.S. Post vacant 6th July and tenable for 6 months. Preference given to pre-registration candidates seeking posts under the Medical Act, 1950.

Applications to Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

ST. HELENS AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. Applications are invited for the post of CASUALTY OFFICER in the Senior House Officer grade, at St. Helens Hospital (196 Beds.) The post is approved for the 6 months training in casualty work required of candidates for the Fellowship examination of the Royal College of Surgeons.

Applications, stating age, qualifications, and experience, and giving 2 names for reference, should be forwarded immediately to N. RICHARDS, Group Secretary.

Whiston Hospital, Prescot.

STIRLING AND CLACKMANNAN HOSPITALS BOARD OF MANAGEMENT. Applications are invited for the post of RESIDENT HOUSE SURGEON (obstetrics) at Airthrey Castle Maternity Hospital as from 1st August, 1956. This is a pre-registration post but is not recognised for the M.R.C.O.G.

Applications should be sent to the Group Medical Superintendent, Stirling Royal Infirmary.

STOCKPORT INFIRMARY, Stockport. (163 Beds.) Applications are invited for the post of HOUSE OFFICER or SENIOR HOUSE OFFICER (medicine).

Applications, stating age, experience, and qualifications together with copies of 2 testimonials, to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport, Cheshire, immediately.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. HOUSE OFFICER (general surgery), vacant now. Pre-registration post. Hospital recognised for F.R.C.S.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE OFFICER (orthopædics) required. Recognised pre-registration post. Hospital recognised for F.R.C.S.

Applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

SUNDERLAND AREA HOSPITAL MANAGEMENT COMMITTEE. RESIDENT ANÆSTHETIST is required for duties at hospitals in the above Group. Senior House Officer grade. Post vacant September. The post offers good practical experience under the supervision of the Visiting Anæsthetists. The hospitals are recognised for the F.F.A.R.C.S. and the D.A. In addition every opportunity is given to attend lectures at the neighbouring University 12 miles away.

Apply to the Group Secretary, Sunderland Area Hospital Management Committee, General Hospital, Sunderland, naming 2 referees.

SWANSEA HOSPITAL, Swansea. (403 Beds.) Glantawe HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the non-resident appointment of CASUALTY OFFICER of Junior Hospital Medical Officer grade at the above Hospital.

Full particulars, stating age, qualifications and experience, should be forwarded immediately to the Hospital Secretary.

SWANSEA. MOUNT PLEASANT HOSPITAL. (238 Beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the resident appointment of JUNIOR HOSPITAL MEDICAL OFFICER for work in the Medical and Surgical Departments, and in the chronic sick wards of the above Hospital.

Applications, stating age, experience, and qualifications, with copies of 2 recent testimonials, should be addressed to the Hospital Secretary.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE PHYSICIAN required for Special Unit for Research in Juvenile Rheumatism, vacant 11th July. Post offers scope for those interested in research, pædiatrics, rheumatology or cardiology.

Applications, stating age, qualifications and experience with dates, with copies of 2 testimonials, to Secretary.

TAUNTON AND SOMERSET HOSPITAL. Applications are invited for HOUSE OFFICER (casualty and orthopædic), vacant from 30th July, 1956. Pre-registration appointment.

Applications, stating age, nationality and qualifications, together with the names of 2 referees, should be forwarded to the Group Secretary, Taunton Hospital Management Committee, Taunton and Somerset Hospital, Musgrove Park Branch, Taunton, Somerset.

TAUNTON AND SOMERSET HOSPITAL. Applications are invited for HOUSE OFFICER (general surgery), vacant from 1st July, 1956. Recognised for F.R.C.S. Recognised for pre-registration candidates.

Applications, stating age, nationality and qualifications, together with the names of 2 referees, should be forwarded to the Group Secretary, Taunton Hospital Management Committee, Taunton and Somerset Hospital, Musgrove Park Branch, Taunton, Somerset.

TAUNTON AND SOMERSET HOSPITAL. Applications are invited for HOUSE OFFICER (pædiatric), vacant from 15th June, 1956. Recognised for the D.C.H. Recognised for pre-registration candidates.

Applications, stating age, nationality and qualifications, together with the names of 2 referees, should be forwarded to the Group Secretary, Taunton Hospital Management Committee, Taunton and Somerset Hospital, Musgrove Park Branch, Taunton, Somerset.

TORQUAY. TORBAY HOSPITAL. (166 general beds). RESIDENT HOUSE OFFICER (surgical), Male or Female, required middle June. Post recognised for F.R.C.S. and pre-registration purposes. There is a complement of 5 Resident House Officers.

Applications, stating qualifications, nationality, and age, together with copy testimonials (quoting reference F.955/70), to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

WELLS, SOMERSET. MENDIP HOSPITAL. Applica-tions are invited for the appointment of RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER at the above Mental Hospital. Salary and conditions of service in accordance with the Whitley Council terms for hospital medical staff. A modern bungalow is available at a rent of £69 p.a. inclusive of rates. Facilities are available for studying for the D.P.M.

Applications, giving particulars, and names and addresses of 2 referees, to be addressed to the Physician-Superintendent, Mendip Hospital, Wells, Somerset.

WELSH REGIONAL HOSPITAL BOARD.

REGISTRAR (general surgery), Pembroke County War Memorial Hospital, Haverfordwest. Resident or non-resident.

REGISTRAR (general surgery), Neath General Hospital. Resident/non-resident. Hospital recognised for F.R.C.S.

Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WELSH REGIONAL BUREAU FOR PRE-REGISTRATION HOSPITAL APPOINTMENTS. It is anticipated that the following Pre-registration HOUSE OFFICER posts at the undermentioned hospitals in the Welsh Region will be vacant on the dates given. These posts have been approved by the Licensing Body for the employment of medical students who, after passing their qualifying examinations, are required to spend a prescribed period in approved hospitals before they become eligible for full registration as medical practitioners.

Forms of application may be obtained from the Regional Bureau, Welsh National School of Medicine, 34, Newport-road, Cardiff, Wales, and should be returned by 16th June, 1956.

Newport and East Mon.

ROYAL GWENT, NEWPORT, MON. (260 Beds)
2 medical—1st August, 1956.
3 surgical—1st August, 1956.
1 gynæcology (surgical)—1st August, 1956.

ST. WOOLOS, NEWPORT, MON. (379 Beds)
2 medical—1st August, 1956.
1 surgical—1st August, 1956.
1 pædiatric (medical)—1st August, 1956. Recognised for D.C.H.

PONTYPOOL AND DISTRICT, PONTYPOOL, MON. (123 Beds)
1 medical—1st August, 1956.
2 surgical—1st August, 1956.

Rhymney and Sirhowy Valleys

CAERPHILLY AND DIST. MINERS', CAERPHILLY, GLAM. (170 Beds)
2 surgical—1st August, 1956.

TREDEGAR GENERAL, TREDEGAR, MON. (56 Beds)
1 surgical—1st August, 1956.

ST. JAMES, TREDEGAR, MON. (156 Beds)
1 medical—1st August, 1956.
1 midwifery—1st August, 1956.

Cardiff

ST. DAVID'S, CARDIFF, GLAM. (590 Beds)
3 medical—1st August, 1956.
1 orthopædic (surgical)—1st August, 1956.
1 midwifery—1st August, 1956.
1 pædiatric (medical)—1st August, 1956.

Merthyr and Aberdare

MERTHYR GENERAL, MERTHYR TYDFIL, GLAM. (120 Beds)
1 medical—1st August, 1956.
1 surgical—1st August, 1956.

ST. TYDFIL'S, MERTHYR TYDFIL, GLAM. (375 Beds)
1 medical—1st August, 1956.
1 surgical—1st August, 1956.

Pontypridd and Rhondda

EAST GLAMORGAN, CHURCH VILLAGE, near PONTYPRIDD, GLAM. (316 Beds)
2 medical—1st August, 1956.
2 surgical—1st August, 1956.
2 orthopædic (surgical)—1st August, 1956.
2 midwifery—1st August, 1956.
1 pædiatric (medical)—1st August, 1956.

Mid Glamorgan

BRIDGEND GENERAL, BRIDGEND, GLAM. (381 Beds)
2 medical—1st August, 1956.
2 surgical—1st August, 1956.
1 midwifery—1st August, 1956.

NEATH GENERAL, NEATH, GLAM. (412 Beds)
2 medical—1st August, 1956.
2 surgical—1st August, 1956.
1 midwifery—1st August, 1956.

Glantawe

SWANSEA GENERAL, SWANSEA, GLAM. (403 Beds)
2 medical—1st August, 1956.
2 surgical—1st August, 1956.

MORRISTON HOSPITAL, near SWANSEA, GLAM. (501 Beds)
2 medical—1st August, 1956.
3 surgical—1st August, 1956.
1 orthopædic (surgical)—1st August, 1956.
1 pædiatric (medical)—1st August, 1956.

LLANELLY, LLANELLY, CARMS. (164 Beds)
1 surgical—1st August, 1956.

West Wales

WEST WALES GENERAL, CARMARTHEN. (188 Beds)
1 medical—8th August, 1956.
1 surgical—8th August, 1956.

PEMBROKE COUNTY WAR MEMORIAL, HAVERFORDWEST, PEMBS. (163 Beds)
1 medical—1st August, 1956.
1 surgical—1st August, 1956.

Mid Wales

ABERYSTWYTH GENERAL, ABERYSTWYTH, CARDS. (81 Beds)
1 medical—1st August, 1956.
1 surgical—1st August, 1956.

Caernarvon and Anglesey

CAERNARVON AND ANGLESEY GENERAL, BANGOR, CAERNS. (130 Beds)
2 medical—1st August, 1956.
2 surgical—1st August, 1956.

LLANDUDNO GENERAL, LLANDUDNO, CAERNS. (134 Beds)
1 medical—1st August, 1956.
2 surgical—1st August, 1956.

ST. DAVID'S, BANGOR (136 Beds)
1 midwifery—1st August, 1956.

Clwyd and Deeside

ROYAL ALEXANDRA, RHYL, FLINTS. (138 Beds)
1 medical—1st August, 1956.

ST. ASAPH GENERAL, ST. ASAPH, FLINTS. (208 Beds)
1 midwifery—1st August, 1956.

Wrexham, Powys and Mawddach

MAELOR GENERAL, WREXHAM, DENBS. (591 Beds)
1 medical—1st August, 1956.
3 surgical—1st August, 1956.
1 pædiatric (medical)—1st August, 1956.

WREXHAM WAR MEMORIAL, WREXHAM, DENBS. (230 Beds)
1 medical—1st August, 1956.
1 surgical—1st August, 1956.
1 orthopædic (surgical)—1st August, 1956.

WELSH REGIONAL HOSPITAL BOARD.

SURGICAL REGISTRAR (plastic surgery), St. Lawrence Hospital, Chepstow. Expected to visit other hospitals in South Wales area. Considerable opportunities for training in specialty. Accommodation for single person.

REGISTRAR (general surgery), based Merthyr General Hospital, Merthyr (120 Beds), also required serve other hospitals in group. Resident/non-resident.

Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WARRINGTON INFIRMARY. (172 Beds.) Applications are invited from persons experienced in anæsthetics for the post of RESIDENT ANÆSTHETIST (Male or Female). Graded as Senior House Officer. The Hospital is recognised for the D.A. examination. Salary is £745 p.a., less a deduction of £130 p.a. for residential emoluments.

Applications, stating qualifications and experience, should be sent to— H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee,
c/o General Hospital, Warrington, Lancs.

WARRINGTON INFIRMARY. (172 Beds.) Applications are invited for the post of RESIDENT CASUALTY OFFICER (Male or Female), now vacant. The post is graded Junior Hospital Medical Officer. Scale of salary £775–£50–£1075, less a deduction of £130 for residential emoluments. Applications will also be considered from Junior Medical Officers who would be graded House Officer or Senior House Officer at the scale appropriate to the experience of the applicant. Consideration will also be given to applicants who desire the appointment on a short-term basis. A whole-time Senior Hospital Medical Officer is in charge of the Department.

Applications, stating age, experience and qualifications should be forwarded or telephoned to —
H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee,
c/o General Hospital, Warrington, Lancs.
(Tel. No. Warrington 1666.)

WESTCLIFF HOSPITAL, Balmoral-road, Westcliff-on-sea, ESSEX. Applications are invited for the post of RESIDENT MEDICAL OFFICER (Senior House Officer grade). Post vacant 14th June, 1956. The Hospital deals with communicable diseases and general medicine. The appointment covers a wide field of medicine and offers excellent training for general practice.

Applications should be sent to the Secretary, General Hospital, Prittlewell-chase, Southend-on-Sea, Essex, not later than 6th June, 1956.

WEST DORSET GROUP OF HOSPITALS. South West METROPOLITAN REGIONAL HOSPITAL BOARD. Required a Whole-time RESIDENT REGISTRAR in Obstetrics and Gynæcology for the above Group for approximately 2 months from 18th June, 1956. The main duties will be in Weymouth and Dorchester. The appointment will be in accordance with the terms and conditions of hospital medical and dental staffs.

Applications, stating age, qualifications and experience, and the names and addresses of 3 referees, to the Area Secretary, Highcroft, Romsey-road, Winchester, by 11th June.

WHITEHAVEN HOSPITAL, Cumberland. (124 Beds. Pre-registration post, recognised F.R.C.S.(Ed.).) HOUSE SURGEON (first, second, or Senior House Officer post), vacant now.

Detailed applications, with dates and names of 2 referees, to Secretary, Workington Infirmary, Cumberland.

WIGAN AND LEIGH HOSPITAL MANAGEMENT COMMITTEE. REGISTRAR in Psychiatry (resident or non-resident) to assist Consultant Psychiatrist. Main centre—Billinge Hospital. Active Psychiatric Unit. Modern treatment. Over 300 admissions annually. Post recognised for D.P.M. Good training facilities.

Applications, with names of 2 referees, to Secretary, Wigan and Leigh Hospital Management Committee, Knowsley House, Wigan.

WOLVERHAMPTON GROUP.

The Royal Hospital, Wolverhampton (An Associated Hospital of the University of Birmingham Medical School)

2 HOUSE OFFICERS (general medicine), vacant mid-July.
1 HOUSE OFFICER (pædiatric), vacant 16th July. Appointment recognised for D.C.H.
1 Locum HOUSE OFFICER (pædiatric), 23rd June–7th July.
3 HOUSE OFFICERS (general surgery), vacant mid-July.
1 HOUSE OFFICER (Locum general surgery). From 1st June for approximately 6 weeks.

Pre-registration posts.

Apply Secretary, with copies of testimonials.

The Royal Hospital (Women's), Park-road West, Wolverhampton

HOUSE OFFICER (gynæcological and obstetric), vacant 27th June. The position is recognised as a combined post for the M.R.C.O.G. and is listed as a pre-registration post by the University of Birmingham.

Apply Secretary, with copies of testimonials.

WORCESTER ROYAL INFIRMARY. (213 Beds.) House SURGEON (pre-registration or otherwise) required. Recognised for F.R.C.S. examination.

Applications to the Secretary.

WREXHAM. MAELOR GENERAL HOSPITAL. (501 Beds.) Applications are invited for the post of HOUSE SURGEON at the above Hospital, to commence duties on 28th June, 1956. The appointment is recognised for the Diploma of F.R.C.S. (Eng. and Edin.) and is a pre-registration post.

Applications, stating age, nationality, qualifications and experience, with copies of 2 recent testimonials, to be sent to the Group Secretary, Maelor General Hospital, Wrexham, as soon as possible.

NORTHERN IRELAND HOSPITALS AUTHORITY. Appointment of Registrars and Tutor/Registrars. Applications are invited for whole-time posts as PRINCIPAL REGISTRAR (Senior Registrar in Great Britain) and SENIOR REGISTRAR (Registrar in Great Britain) in hospitals in Northern Ireland for the period 1st October, 1956–30th September, 1957. Vacancies will occur in all specialties. Some of the appointments will be made jointly by the Queen's University, Belfast, and the Authority, and will involve teaching and other University duties as Principal or Senior Tutor.

Applications to be made as soon as possible on a form obtainable (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, 44–46, Queen-street, Belfast.

IBADAN, NIGERIA. UNIVERSITY COLLEGE HOSPITAL. The Board of Management invite applications for the post of BLOOD TRANSFUSION OFFICER in the grade of Senior Registrar in the Department of Pathology. Applicants should have wide experience of organising a blood transfusion service both from the administrative and technical points of view and the person appointed will take over the organisation of the service for the University College Hospital, Ibadan. No local authority blood transfusion service exists.

Salary: First tour £1428 p.a.; second tour £1482 p.a.; third tour £1542 p.a.; fourth tour £1596 p.a.; plus inducement addition of £300 p.a. for expatriate doctors.

Gratuity: On satisfactory completion of agreement a gratuity of £37 10s. will be paid for each completed period of 3 months service.

Outfit allowance: £60 payable on first appointment.

Duration of engagement: 1 tour of 1 year in the first instance renewable by mutual agreement up to a total of 4 tours.

Leave: Expatriate candidates will be eligible for 7 days leave in the United Kingdom on full pay for each completed month of service.

Passages: Free first-class passages to and from Nigeria are provided for expatriate doctors and their wives on first appointment, annual leave and on completion of agreement. Free first-class passages to Nigeria will be provided for Nigerian doctors and their wives.

Children's allowances: Candidates will be eligible for children's allowances in accordance with existing regulations.

Superannuation: Arrangements can be made to enable doctors to continue their National Health Service superannuation scheme contributions, and details of the revised salary and gratuity payable in such cases will accompany application forms.

Applications should be submitted not later than 25th June, 1956, on the appropriate forms, which can be obtained, with further particulars, on receipt of an addressed foolscap envelope from the Adviser on Staff Recruitment, London Office, University College Hospital, Ibadan, 57, Catherine-place, London, S.W.1.

IBADAN, NIGERIA. UNIVERSITY COLLEGE HOSPITAL. The Board of Management invite applications for the post of REGISTRAR (or SENIOR HOUSE OFFICER) in Tuberculosis in the Department of Medicine. Appointment for 1 tour of 12 months in first instance, renewable (in case of Registrar appointment) for a further tour. Previous experience in tuberculosis not essential. Successful candidate to assume duty mid-September. Predominantly outpatient clinic work. Limited inpatient accommodation and thoracic surgery. Opportunity for young man interested in development of methods for treatment of tuberculosis applicable to medically under-developed conditions.

Salaries—

Registrar: First tour £1164 p.a.; second tour £1212 p.a.; plus inducement addition of £270 p.a. for expatriate doctors.

Senior House Officer: £1116 p.a., plus inducement addition of £270 p.a. for expatriate doctors.

Gratuity: On satisfactory completion of agreement a gratuity of £37 10s. will be paid for each completed period of 3 months service.

Outfit allowance: £60 payable on first appointment.

Quarters: Partly furnished quarters are provided at a rental of 8½% of salary, excluding inducement addition.

Leave: Expatriate candidates will be eligible for 7 days leave in the United Kingdom on full pay for each completed month of service.

Passages: Free first-class passages to and from Nigeria are provided for expatriate doctors and their wives on first appointment, annual leave and on completion of agreement. Free first-class passages to Nigeria will be provided for Nigerian doctors and their wives.

Children's allowances: Candidates will be eligible for children's allowances in accordance with existing regulations.

Superannuation: Arrangements can be made to enable doctors to continue their National Health Service superannuation scheme contributions, and details of the revised salary and gratuity payable in such cases will accompany application forms.

Applications should be submitted not later than 30th June, 1956, on the appropriate forms, which can be obtained, together with further information regarding nature and scope of work, on receipt of an addressed foolscap envelope from the Adviser on Staff Recruitment, London Office, University College Hospital, Ibadan, 57, Catherine-place, Palace-street, London, S.W.1.

SOUTH AFRICA. DONALD FRASER HOSPITAL, SIBASA, NORTHERN TRANSVAAL. Applications are invited for the post of ASSISTANT MEDICAL OFFICER in the above Mission Hospital. Applicants must be interested in the physical and spiritual welfare of the African Staff and patients. Salary scale £825–£75–£900–£100–£1000–£50–£1250, plus £200 cost-of-living allowance. Previous experience will be taken into consideration in determining commencing salary. The Hospital has 180 Beds and is planning to add another 100 beds for patients suffering from tuberculosis. There are 2 well-equipped operating theatres and an X-ray plant.

Applications, giving details of age, experience, and qualifications, together with the names and addresses of 2 referees, should be addressed to the Medical Superintendent, Donald Fraser Hospital, P.O. Vhufuli, Via Sibasa, Northern Transvaal, South Africa.

CHANNEL ISLANDS, JERSEY. GENERAL HOSPITAL. Applications are invited for the post of MEDICAL OFFICER which will be vacant on 1st August, 1956, in the above Hospital. The appointment is for 6 months but is renewable for a further 6 months. Salary £575 p.a., less £125 for residential emoluments.

Applications to be submitted not later than 15th June, 1956, to the President, Public Health Committee, General Hospital, Jersey, C.I.

Public Appointments

CARDIGAN. COUNTY OF CARDIGAN. Appointment of Joint Medical Officer (Male). The County Council and the County District Councils of the County of Cardigan invite applications from duly qualified Male registered medical practitioners holding registered Diplomas in Public Health for the following whole-time joint appointment which becomes vacant on 1st October, 1956:—

1 Medical Officer to act as DEPUTY COUNTY MEDICAL OFFICER and as MEDICAL OFFICER OF HEALTH respectively to the following districts:—

The Boroughs of Aberystwyth, Cardigan and Lampeter; the Urban Districts of Aberaeron and New Quay; the Rural Districts of Aberaeron, Aberystwyth, Teifiside and Tregaron.

As Deputy County Medical Officer the successful candidate will act under the direction of the County Medical Officer. As District Medical Officer of Health he will be subject to the Sanitary Officers (Outside London) Regulations, 1935 and 1951. Previous local authority experience desirable. Applications from persons sitting for the D.P.H. examination in June will be considered. Knowledge of Welsh will be regarded as an additional qualification. Salary determined in accordance with the decisions of Medical Council Committee "C," will be £1625–£52 10s.–£1835 plus the further percentage increase recently announced. A motor-car allowance will be paid in accordance with the recommendation of Committee "C" of the Medical Whitley Council. The appointment will be subject to the provisions of the Local Government Superannuation Acts, 1937–53, and the successful candidate will be required to pass a medical examination. The County Council appointment will be subject to 3 calendar months notice on either side.

Application forms may be obtained from the undersigned. Closing date 9th June, 1956.

J. E. R. CARSON, Clerk of the County Council.

Swyddfa'r Sir, Aberystwyth.

DUBLIN. LOCAL APPOINTMENTS COMMISSION. Positions vacant.

(1) SURGEON, Galway County Council. Salary £1775, with permission to engage in private practice. The person appointed will be allowed the use of certain beds and may undertake, if offered, a University teaching appointment.

(2) SURGEON, Kerry County Council. Salary £1635, with permission to engage in private practice plus the use of certain beds.

Application forms and particulars from the Secretary, Local Appointments Commission, 45, Upper O'Connell-street, Dublin. Latest time for receiving completed application forms 5 P.M. on 8th June, 1956.

HER MAJESTY'S OVERSEA CIVIL SERVICE. GOVERNMENT OF ZANZIBAR. PATHOLOGIST required to administer Central Government Bacteriological and Pathological Laboratory, train laboratory assistants, conduct medico-legal investigations, and perform other duties which the Director of Medical Services may require. Qualifications: On United Kingdom Register with experience in medical laboratory work. Appointment on permanent basis with pension (non-contributory), or on short-term contract with gratuity (taxable). Candidates in the National Health Service may leave the National Health Service but retain superannuation rights up to 6 years and receive a taxable gratuity of 20% of the aggregate of their salary. Salary scale £1116–£1836 p.a. Temporary (non-pensionable) cost-of-living allowance from £111 to £162 p.a. Starting salary according to qualifications and experience. Furnished quarters at low rental. Free passages in both directions for Officer and family up to a cost of 3 adult passages. Income-tax at local rates. Local leave permissible and generous home leave granted after each tour of from 2 to 3 years. Educational facilities available in East Africa.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (reference No. BCD.117/10/05).

LANCASHIRE COUNTY COUNCIL. Applications invited from registered medical practitioners for appointments as ASSISTANT DIVISIONAL MEDICAL OFFICERS in areas adjacent to Bolton and Manchester. Possession of D.P.H. desirable. Salary £975–£1375 p.a. Travelling and subsistence allowances where applicable.

Application forms and further particulars from County Medical Officer, Serial 606, East Cliff County Offices, Preston.

LONDON COUNTY COUNCIL. Applications are invited from medical practitioners practising in locality under National Health Service for appointment as VISITING MEDICAL OFFICER to a new home for 30 old people at 5, Holland-park, W.11. Remuneration £30 a year plus fees receivable from Executive Council in respect of residents and residential staff who may be taken on National Health Service list.

Particulars and application form from the Medical Officer of Health (PH/D1/968), County Hall, Westminster Bridge, S.E.1, and returnable by 14th June.

SURREY COUNTY COUNCIL. Child Guidance Clinics. Appointment of Part-time PSYCHIATRISTS. Applications are invited from medical practitioners for these appointments in the Guildford and Richmond areas. Candidates should possess the D.P.M. and have had previous experience of child guidance work. Remuneration at the rate of 4 guineas per session.

Applications, stating age, qualifications and experience, with the names of 2 referees, to County Medical Officer, County Hall, Kingston upon Thames, by Saturday, 16th June, 1956.

TREASURY MEDICAL SERVICE. Applications are invited from Medical Practitioners, practising in the districts detailed below, for appointment, in a part-time and mainly advisory capacity, as LOCAL TREASURY MEDICAL OFFICER for each of the places or groups of places shown. The town shown in brackets after the place-names indicates the Head Post Office Area in which the place, or group of places, is situated. Successful applicants will be required to examine and report on the condition of certain Government Officers, teachers, candidates for appointment, &c., who may be referred to them from time to time; and to attend when summoned to an emergency case of accident or sudden illness occurring in a Government office in the neighbourhood. Fees for this work, and mileage allowance where necessary, will be paid on a scale agreed with the British Medical Association.

Intending applicants should write, within 14 days, to Treasury Medical Adviser, Treasury Chambers, Whitehall, S.W.1, for a form on which application may be made. Applicants should be not more than 60 years of age.

The places for which applications are invited are as follows :—

ENGLAND AND WALES

Hartley Wintney (Basingstoke).
Newport (Cardigan).
Bellingham, Falstone, West Woodburn, Kielder and Otterburn (Hexham and Newcastle-on-Tyne).
Holbrook (Ipswich).
Hethersett (Norwich).
Brigg (Scunthorpe).
Leigh-on-Sea (Southend-on-Sea).

SCOTLAND

Haddington (Haddington).
Kirkcowan (Newton Stewart).
Dollar (Stirling).

WEST HARTLEPOOL. COUNTY BOROUGH OF WEST HARTLEPOOL. Applications are invited for the appointment of DEPUTY MEDICAL OFFICER OF HEALTH AND DEPUTY PRINCIPAL SCHOOL MEDICAL OFFICER from registered medical practitioners possessing the Diploma in Public Health or similar qualifications. Candidates should have experience in the ascertainment of educationally subnormal pupils and preferably be approved by the Ministry of Education for this purpose. The officer appointed will be required to carry out such duties as shall be allocated from time to time by the Medical Officer of Health. The salary scale applicable to the post is £1396 p.a., rising by yearly increments of £52 10s. to a maximum of £1606 p.a. Previous service with a local authority will be taken into account in fixing the commencing salary within this scale. A car allowance is normally payable. The post is superannuable and subject to 2 months notice in writing on either side. The successful applicant will be required to pass a medical examination.

Applications, giving full details of the applicants age, experience and qualifications, together with names and addresses of 3 referees, should be sent to reach the Medical Officer of Health, Durham House, Victoria-road, West Hartlepool, not later than Thursday, 14th June, 1956. ERIC J. WAGGOTT, Town Clerk.

Municipal Buildings, West Hartlepool, 18th May, 1956.

WINDWARD ISLANDS. District Medical Officers required for general duties in St. Vincent, with liability for service in any institution or district within the Windward Islands. Appointments on permanent basis with pension (non-contributory) or on agreement for 3 years. Salary scale £800–£1000 a year. Pension 1/600th of final pensionable emoluments for each completed month of service. Income-tax at local rates. Private practice if duties permit or non-pensionable allowance of £100 a year in lieu. If posted to Bequia or Chateaubelair non-pensionable allowances payable of £312 10s. and £100 a year respectively. Unfurnished quarters provided at rental not exceeding 10% of salary. Free passages for Officers and families up to 5 persons in all. Leave passages for officers and wives once every 5 years. Generous home leave after each tour. Candidates must hold medical qualifications registrable in the United Kingdom.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting BCD. 117/43/03).

Appointments : Too Late for Classification

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. Applications are invited for the appointment of NON-RESIDENT REGISTRAR (E.N.T. Department) for duties within the United Hospitals to commence on 1st September, 1956. Applicants should have had previous experience in the specialty and a higher qualification is desirable.

Forms of application may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Edgbaston, Birmingham, 15, and should be returned not later than 16th June, 1956.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE.

Park Hospital, Davyhulme (General Hospital—433 Beds)

HOUSE OFFICER (general medicine) required (pre-registration). Post vacant end July, 1956.

HOUSE OFFICER (obstetrics) required (pre-registration). Post recognised for M.R.C.O.G. examination. Post vacant end July, 1956.

SENIOR HOUSE OFFICER (paediatrics) required. Hospital recognised for training for Diploma in Child Health. Post vacant end July, 1956. Application forms from Secretary.

PETERBOROUGH. MEMORIAL HOSPITAL. PETERBOROUGH AND STAMFORD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the position of HOUSE PHYSICIAN which will become vacant on 24th July, 1956. The appointment will be for 6 months.

Applications, with testimonials, should be addressed to the Secretary, Memorial Hospital, Peterborough.

General Practice

For an Executive Council post (England and Wales) apply on form E.C.16A obtainable from the council. Mark envelope "Vacancy."

HARE STREET AND LITTLE PARNDON NEIGHBOURHOOD, HARLOW NEW TOWN. Applications invited for VACANCY (urban) in above Neighbourhood, which is now under development. Not retirement or death vacancy. No list of patients. Subject to appropriate conditions. Initial practice allowance will be payable. Residential and temporary surgery accommodation will be available, but successful candidate will be expected to undertake to practise solely from a combined practice and clinic centre which will be opened eventually. Apply on Form E.C.16A before 16th June, 1956, to—

E. BERGDAHL, Clerk of the Council.
Essex Executive Council, 131/3, Fillebrook-road, Leytonstone, E.11.

MALDEN AND COOMBE, SURREY. Applications invited for VACANCY due to death in above borough (intermediate). List about 1700. Residence and surgery available for purchase. Applications on Form E.C.16A to reach the undersigned not later than 14th June, 1956.

S. H. BENNETT, Clerk of the Council.
187, Ewell-road, Surbiton.

Miscellaneous

Esso Petroleum Company. A vacancy exists for a full-time Medical Officer, well qualified, with good clinical experience and preferably under 40 years of age. Previous industrial experience not essential. Starting salary not less than £1650. Good pension scheme.—Full particulars may be obtained by writing to the Chief Medical Officer, Esso Petroleum Company, 16, Charles II-street, London, S.W.1.

Large Pharmaceutical Manufacturing Company with world-wide organisation has a vacancy at its headquarters in Basle, Switzerland, for a young British qualified medical practitioner. The appointment would necessitate residence in Switzerland but some overseas travel would be required. It is a permanent and progressive post and is concerned with medical information, research into methods of introduction of pharmaceutical products, and development of liaison with the Company's overseas subsidiaries. Candidates should not be more than 35 years of age, have had several years clinical experience, a good working knowledge of German and some knowledge of French. A facility for writing is essential.

Applications, with details of training, experience and age, to : Address, No. 226, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Bayer Products Ltd. Applications are invited for the new appointment of a Research Bacteriologist at the Bayer Biological Institute, Exning, Suffolk. The successful applicant would be required to undertake investigational work in connection with the manufacture, application and development of new biological and pharmaceutical products for veterinary purposes. Applicants should have had bacteriological research experience ; a knowledge of veterinary bacteriology and animal diseases would be useful but is not essential.

Applications, with the names of 2 persons willing to act as referees, should be addressed to the Head of the Bayer Biological Institute, Bayer Products Ltd., Exning, Newmarket, Suffolk.

Lease of recently established surgery. Possibility of I.P.A. Ample scope. Small premium. (Outer) North London.—Address, No. 227, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Required—partnership with view to eventual succession, residential area London. Capital available for house purchase.—Address, No. 228, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

For sale owing to death ; lease of Harley-street premises ; fully equipped with latest Radiological Diagnostic equipment ; fully furnished ; terms to be arranged.—Write : Box 825, REYNELLS', 44, Chancery-lane, W.C.2.

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimen of urine and £1 1s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE LTD., 98, Victoria-street, S.W.1 (Phone : VICtoria 0141), who are specialists in this kind of work.

Typewriting and Duplicating. First-class work at moder-ate prices by experienced medical typists. Electric machines. —SYBIL RANG, 21, Heath-street, Hampstead, London, N.W.3 (HAM 5329/0504).

Two-compartment Water Steriliser by Manlove and Alliott, gas-heated—for sale. In perfect condition, £100.—ALDERSON, Offchurch, Leamington Spa.

New Austin Cars from £270 13s. 6d. down, 24 payments £12 8s. 2d. Reduced interest and insurance.—SAUNDERS, Austin House, 140, Golders Green-road, Golders Green, London, N.W.11.

XLV Pure Devon Honey. The famous and "so delicious" Heather/Clover blend. Six 1-lb. jars 32s. Carriage paid. Twelve 1-lb. 60s.—WOODBURY APIARIES (L), Woodbury, near Exeter.

Professional, technical and personal typewriting. Dupli-cating, circularising, &c., efficiently and speedily executed.—"MOWBRAY," 146, Bishopsgate, E.C.2 (BIS. 2545, BAR. 7665).

Hypnotism. Will all Doctors interested in this subject for Medical purposes please write to the Secretary, British Society of Medical Hypnotists, 126, Harley-street, W.1.

PUBLISHED by the PROPRIETORS, THE LANCET LIMITED, 7, Adam Street, Adelphi, in the County of London.
Printed by HAZELL, WATSON & VINEY, LTD., London and Aylesbury—Saturday, June 2, 1956.
PRINTED IN GREAT BRITAIN—Entered as Second Class at the New York, U.S.A., Office.

appetite must be controlled

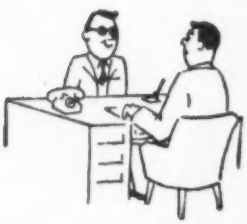
Fat people die first — as any insurance company knows. To live longer, they must eat less.

'Dexedrine' is the safe, *effective* drug for the control of appetite in weight reduction. 'Dexedrine' not only makes it easier for the patient to eat less, but also prevents the irritation and depression that so often accompany the start of a reducing regimen.

Dexedrine—**safe, *effective* appetite control**

Smith Kline & French
represented by Menley & James, Limited, Coldharbour Lane, London, S.E.5
Samples and literature available on request.

DP66



Everyone is talking about...

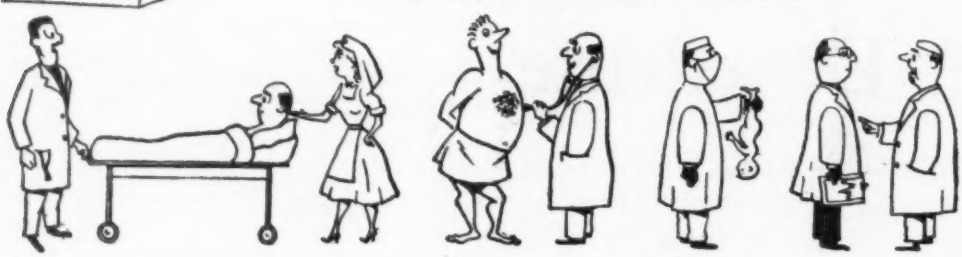
... PANADOL—the new Bayer analgesic which contains no aspirin, phenacetin or codeine. Panadol relieves pain without causing side-effects such as gastric irritation or constipation, and is fast becoming established as a safe, effective analgesic for headaches, rheumatic and arthritic pain, colds and 'flu. *Panadol is not a scheduled poison, and may be prescribed on form E.C.*10.

PANADOL

Trade Mark

Tablets, 0.5*g*. *N-acetyl-p-aminophenol, in bottles of* 100 *and* 500.

BAYER PRODUCTS LIMITED

Neville House, Kingston-on-Thames, Surrey

Export enquiries to: WINTHROP PRODUCTS LTD.